8-1978

Should Modality Be a Consideration in the Selection of an Approach to Beginning Reading?

Shirley Bethlehem Wallace
The College at Brockport

SHOULD MODALITY BE A CONSIDERATION IN THE SELECTION OF AN APPROACH TO BEGINNING READING?

THESIS

Submitted to the Graduate Committee of the
Department of Curriculum and Instruction
Faculty of Education
State University College at Brockport
in Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Education

by

Shirley Bethlehem Wallace

State University College at Brockport
Brockport, New York

August, 1978

APPROVED BY:

F. Mooney Whited 8/25/78
Graduate Advisor Date

F. Mooney Whited 8/25/78
Project Advisor Date

Ralph Jordan 31 Aug 78
Graduate Director Date

Abstract

The purpose of the study was to examine the results of an effort to select an approach to first-grade reading for each child in accordance with his modality strength as determined by an informal modality test. In their kindergarten year, 60 middle-class children with at least average intelligence were given three readiness tests, the Peabody Picture Vocabulary Test, Metropolitan Readiness Tests, and an informal modality test. Children were grouped (four groups) for first-grade reading instruction on the basis of their scores on the informal modality test. Those whose scores indicated an auditory strength were instructed via the Open Court Correlated Language Arts Program. The Harper and Row Basic Reading Program was used for teaching children with a visual strength. Children whose scores did not indicate a particular strength were placed in either program.

Results indicated that despite the effort to match each child's modality strength to a mode of instruction, 11 children were not reading at a minimum 1.5 grade level at the end of grade one. Stanford Achievement Test reading scores (A + B) were not significantly different ($p > .05$) among the four groups. Significant ($p < .05$) predictors of first-grade reading achievement for the total group were the Metropolitan Readiness Tests (Pre-Reading Skills Composite), and the auditory and visual portions of the informal modality test.

Table of Contents

Table of Contents (Continued)

List of Tables

List of Figures

Chapter I

Statement of the Problem

Purpose

The purpose of this study was to examine the results of an effort to select an approach to first-grade reading for each child in accordance with his modality strength as determined by an informal modality test.

Learning to read is a complex process. Readiness for learning to read is likewise complex. Harris (1970) states:

> The major characteristics which are important in reading readiness are age, sex, general intelligence, visual and auditory perception, physical health and maturity, freedom from directional confusion, background of experience, comprehension and use of oral English, emotional and social adjustment, and interest in reading. (p. 21)

This study focused on the visual and auditory perceptual aspects of readiness as they are related to the modality concept. Should children who demonstrate greater strength in either the visual or auditory mode be taught beginning reading via an approach which emphasizes their strength? Does an informal modality test make a contribution to the assessment of reading readiness?

Readiness tests, including an informal modality test, were administered to all kindergarten children in one elementary school. Their reading achievement was determined by the Stanford Achievement Test (A + B) at the end of first grade. The children were grouped

as auditory (A), visual (V), or auditory-visual (A-V) pupils on the basis of the informal modality test and were instructed in first grade via a method which emphasized their strength if they were auditory (A) or visual (V) pupils. The Open Court Correlated Language Arts Program (1972) was used to instruct one auditory-visual group and the auditory group; the Harper and Row Basic Reading Program (1966) was used to instruct one auditory-visual group and the visual group. Questions posed and hypotheses formulated were as follows:

Questions

1. Were the visual pupils reading at a minimum 1.5 grade level at the end of the first grade?

2. Were the auditory pupils reading at a minimum 1.5 grade level at the end of first grade?

3. Were the auditory-visual pupils using the Harper and Row Basic Reading Program reading at a minimum 1.5 grade level at the end of first grade?

4. Were the auditory-visual pupils using the Open Court Correlated Language Arts Program reading at a minimum 1.5 grade level at the end of first grade?

5. For each of the four groups and for the total group, what are the best predictors of first grade reading achievement? The following were considered: Peabody Picture Vocabulary Test score, Metropolitan Readiness Tests (Pre-Reading Skills Composite) score,

the total score on the auditory portion of the informal modality test, and the total score on the visual portion of the informal modality test.

6. For each of the four groups and for the total group, which of the items on the informal modality test are the best predictors of first grade reading achievement?

Hypotheses

1. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory group and the visual group.

2. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory group and the auditory-visual group using the Open Court Correlated Language Arts Program.

3. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the visual group and the auditory-visual group using the Harper and Row Basic Reading Program.

4. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory-visual group using the Harper and Row Basic Reading Program and the auditory-visual group using the Open Court Correlated Language Arts Program.

Background for the Study

> One of the most important things, if not the most important thing, I learned from studying the existing research on beginning reading is that it says nothing consistently. It says too much about some things, too little about others. And if you select judiciously and avoid interpretations, you can make the research "prove" almost anything you want it to. (Chall, 1967, p. 87)

Although Chall made this observation in 1967, it is still a valid statement. Considerable evidence exists to support the generalization that there is no one method of teaching beginning reading which is best for all children (Bond and Dykstra, 1967; Chall, 1967; Wittick, 1968).

Psychologists have pointed out the necessity for considering individual differences when formulating learning theory (Cronbach, 1967; Gagné, 1967; Glaser, 1967; Jensen, 1967). Bracht (1970) states:

> Given a common set of objectives, some students will be more successful with one instructional program and other students will be more successful with an alternative instructional program. Consequently, a greater proportion of students will attain the instructional objectives when instruction is differentiated for different types of students. (p. 627)

Bond and Tinker (1957) are among those authorities in the reading field who also support the need for taking individual differences into consideration. They say:

> Beginning in grade one and in every grade thereafter, reading instruction can be effective for all pupils only when there is satisfactory adjustment to individual differences. Without such adjustment, reading difficulties arise. (p. 116).

And more recently Snyder and Pope (1972) concluded, "There is great

variability of capacity among and within children, and the use of a uni-modal teaching approach seems highly inappropriate" (p. 625).

Variation in general ability or intelligence seems to be an obvious aspect of individual differences to consider. Relationships between intellectual differences among children and reading achievement have been explored. Durkin's (1966) longitudinal study of children who learned to read prior to the initiation of formal instruction found that the 49 children whose mean grade-equivalent reading achievement was 2.3 at the beginning of first grade ranged in Stanford Binet IQ scores from 91 to 161. Intelligence correlated only .40 with reading achievement in first grade, but the correlation increased in successive grades and was .79 at fifth grade. In a well documented paper Singer (1973) discusses the variable relationship between IQ and reading:

> The explanation for this variable relationship is that if a particular reading task, such as acquisition of symbol-sound correspondence is within the mental age range of a group of students and instructional conditions allow adequate time for achieving the task, the IQ may have a significant relationship to rate of acquisition, but not to accomplishment of the task. However, if the reading task challenges even the most capable students in the class and time or trials for learning the task is limited, then IQ is likely to be highly correlated with achievement of the task. (p. 1)

Thus IQ is less likely to be a factor at the beginning stages of learning to read, but it plays a greater role when higher levels of comprehension are the goal. Chester (1974) also observed that the correlations between various IQ test scores and reading tend to increase with grade level.

Harrington and Durrell (1955) found that auditory and visual discrimination are more closely related to success in acquiring a primary grade vocabulary than is intelligence. The importance of auditory and visual factors is expressed by Birch and Belmont (1965):

> Opposite age trends in association appear to exist between auditory-visual integration and reading ability and between IQ and reading ability. Whereas the association between auditory-visual integrative performance and reading ability is strongest in the youngest age groups, the correlations moving from a high level of significance to levels of non-significance with age, the level of association between IQ and reading is highest in the oldest age group. This finding suggests that primary perceptual factors may be most important for initial acquisition of reading skill but that factors more closely associated with IQ are more important in its elaboration. (pp. 302-303)

The developmental nature of perceptual skills is described by Rosner (1971).

> It appears safe to assume that perceptual skills are developed proceeding along a continuum determined by biological integrity and experience. All developed skills seem to emerge as undifferentiated patterns that become more discrete. (p. 544)

Frostig and Horne (1964), Wepman (1971), and Snyder and Pope (1972) also state that visual and auditory perceptual skills are developmental and may not have reached maturation for six-year-olds, the age of most first graders.

Thus visual and auditory perceptual abilities are factors which might be taken into consideration when planning instructional programs for beginning readers. In addition, these factors might be considered in terms of the modality concept of differential learning aptitudes.

Charcot, as discussed by Freud (1891/1953) suggested that individuals differ in their reliance on perceptual modalities for learning. He indicated three types of learners: auditory, visual, and kinesthetic. Wepman (1968), who based his opinion on the ". . . clinically observed fact that many children with learning problems appeared to have greater facility in using one input pathway than in using another and--an observation of equal importance--they had considerably less facility along other pathways" (pp. 1-2), supported the concept that individuals have specialized proclivities for learning. Wepman observed children with known neurological impairments as well as children with no demonstrable impairment. He stated, "The concept of differential use of the separate input pathways is no longer purely theoretical but is assuming the proportions of an acceptable fact about children and their learning" (Wepman, 1968, p. 3). Harris (1964) and de Hirsch, Jansky, and Langford (1966) also pointed out the possibility of individual differences in modes of learning.

Among those who favor matching modality aptitude to instructional procedures are: Neville (1970), Harris and Roswell (1953), Stephens (1970), Johnson and Myklebust (1967), and Wepman (1971). Dechant (1967) summarized his opinion based on a review of literature related to modality:

> In addition to an understanding of the pupil's maturational, experiential, intellectual, neural, physical, social, emotional, motivational, language, and sensory characteristics, knowing the pupil means knowing his preferred mode of learning. Identification of the child's mode of learning may well be the end goal of all classroom diagnosis. (p. 29)

The modality concept of differential learning aptitudes appears to offer the possibility of contributing information about children which might aid in the selection of an appropriate approach to beginning reading for them. In addition future reading problems might be prevented.

Definitions

Modality refers to the sensory pathway through which children learn (Robinson, 1972).

Modality concept of differential learning aptitudes as it relates to reading refers to the belief that each child's maximal modality or pathway of learning should be determined before an approach to reading is selected for him.

Visual pupils are those children whose scores on the visual portion of the informal modality test were ten points or more higher than their scores on the auditory portion.

Auditory pupils are those children whose scores on the auditory portion of the informal modality test were ten points or more higher than their scores on the visual portion.

Auditory-visual pupils are those children who did not have a ten point differential between their scores on the visual and auditory portions of the informal modality test.

Auditory perception refers to the process by which phenomena are apprehended when the stimuli are received through the ear (Robinson, 1972).

Visual perception refers to the process by which phenomena are apprehended when the stimuli are received through the eye (Robinson, 1972).

Limitations

This study will be limited to an examination of the modality concept as it relates to selecting an approach to teaching first-grade children with average or above average intelligence to read. Only the auditory and visual modes will be considered.

Summary

The modality concept of differential learning aptitudes as it relates to beginning reading is an important factor for consideration. Because of the developmental nature of auditory and visual perceptual abilities and their importance as a readiness factor for learning to read in first grade, and because children have different learning styles, a better understanding of the relationship between auditory and visual perception and first-grade reading might provide a rationale for the selection of appropriate materials for use with individual children in the first grade.

Chapter II

Review of the Literature

The results of matching the learning modality (visual or auditory) of the individual with an approach to beginning reading which emphasized that aptitude were examined in this study. "Research concerned with modal preference as related to learning has been conducted consistently since the latter part of the nineteenth century" (Jones, 1971, p. 1). Sources of summaries related to this research are: McGeoch and Irion (1952), Witty and Sizemore (1958, 1959a, 1959b) and Jones (1971, 1972). Two additional sources referred to by Jones (1971) are Henmon (1912) and Day and Beach (1950). Jones (1971) observed:

> However, the purpose of most of these studies was the comparison of listening and reading as input channels for the comprehension of verbal and printed materials or the learning of lists of words or nonsense syllables by groups. In these studies, the factor of individual differences has been seen less as a point for research than as an annoying variable accounting for many of the conflicting findings of modality research. Consequently, only a few studies have made an effort to determine the role of individual modal preferences in learning and fewer still have been concerned with learning to read. (p. 2)

Silverstone and Deichmann (1975) described various reading models and classified them as being behavioristic, cognitive, or developmental. They reviewed the sense modality research in terms of supportive or unconfirming research results for differing viewpoints regarding the perceptual process in reading. The two viewpoints are:

> (a) The perceptual process in reading involves a hierarchy of discrimination skills. Reading deficits occur when prerequisite discriminations are not mastered (behavioristic, cognitive). (b) Perceptual processes in reading are developed epigenetically from basic sensorimotor coordination skills. Decentration in correspondence with general maturation influences perceptual development (developmental). (p. 155)

Matching instructional methods to children's learning preferences is one aspect of aptitude-treatment interaction research. Ysseldyke (1973) reviewed the literature related to aptitude-treatment interaction (ATI) research which has resulted in the development and support of diagnostic-prescriptive teaching for educationally handicapped children. Bracht (1970) reported on his systematic analysis of 90 research studies which were designed to permit a test of aptitude-treatment interaction.

Thus, a considerable body of research exists which is concerned with learner variables and their interaction with various treatments. The main concern of this paper is with that research which has investigated the efficacy of matching the preferred mode of the individual (either auditory or visual) with an approach to beginning reading which is largely dependent on that mode.

Many studies report significant correlations between auditory and visual perceptual skills and measures of reading achivement in the primary grades (Dechant & Smith, 1977). Robinson (1972) said:

> A careful perusal of factors which appear to interact with progress in beginning reading clearly identifies visual and auditory abilities. The physical aspects of vision and hearing have shown little interaction with reading. However, the functional aspects, perception of what is seen and heard, appear to be more promising. (p. 10)

In order to establish the relationship of auditory and visual perceptual skills to success in beginning reading, reviews of literature and several studies in each of these areas were examined.

Studies of Auditory Skills

Durrell and Murphy (1953) presented a summary of their findings related to auditory discrimination from work done at Boston University. They concluded:

> Although there are many factors which combine to determine the child's success in learning to read, it is apparent that his ability to notice the separate sounds in spoken words is a highly important one. Observations in our clinic bear out the above findings in intensified form. Almost every child who comes to the clinic with a reading achievement below first grade has a marked inability to discriminate sounds in words. Children who are severely handicapped in this ability seldom achieve primer level in reading. (p. 560)

Thompson (1963) tested a group of children prior to first grade and at the end of second grade with the following instruments: Wepman Auditory Discrimination Test, Boston University Speech Sound Discrimination Picture Test, Auditory Discrimination and Orientation (a subtest of the SRA Reading Analysis Aptitude), the WISC, and Gates Advanced Primary Reading Test. She found auditory discrimination and intelligence to be highly correlated with success in primary reading. She concluded from the performance of her sample that children grow or improve in auditory discriminative abilities from the time they enter first grade. Inaccurate, rather than accurate, discriminative ability was more characteristic of

first-grade entrants; the reverse being found at the end of second grade. Among other conclusions, she stated that auditory discriminative abilities were prognostic of good readers.

Wepman's (1960) study dealt with the auditory discrimination (evaluated by the Wepman Auditory Discrimination Test), articulation, intelligence, and reading achievement of 156 first and second grade children. He found a significant relationship between poor reading scores and poor discrimination scores. He suggested that children entering school should be studied to determine whether or not their auditory abilities have matured enough so that they can benefit from phonic instruction in reading. Wepman reasoned:

> Unless this is done, we will continue to make the error of approaching all children as though they can learn equally well through the same modality. Children who are poor in discrimination will be given the same instruction as others with good discrimination, etc. The need to individualize instruction, at least to the point of grouping visual learners and auditory learners separately at the onset of reading instruction, seems an obvious way to minimize the problem. (p. 332)

He suggested sight reading for those children with poor auditory discrimination and phonics for those with good discrimination.

Groff (1975) is critical of Wepman's work and in particular his description of children as having auditory discrimination that was "not adequate for their age" or "adequate." He feels that this was an arbitrary decision on Wepman's part and that the validity of Wepman's Auditory Discrimination Test is questionable.

Dykstra (1966) reported on the relationships between seven pre-reading measures of auditory discrimination and reading

achievement at the end of first grade for the 632 children in his sample. Because of the relatively low relationships found between the auditory discrimination abilities measured by the instruments used in his investigation and success in learning to read, he did not feel that developing the auditory discrimination abilities of children will be enough to ensure success in learning to read. However he does say:

> The fact that a majority of the measures was significantly related to the two measures of reading achievement indicates that the ability to make auditory discriminations may contribute to success in learning to read, and that attention, therefore, should be given to instructing children along these lines. (p. 32)

Although their review of 33 studies encompasses research at all elementary grade levels and two studies at the secondary level, mention should be made of Hammill and Larsen's (1974) work. Their review was of studies using correlational statistical procedures to examine the relationship of reading to measures of auditory discrimination, memory, blending, and auditory-visual integration. Hammill and Larsen said, "The consensus of this research suggests that the auditory skills are not sufficiently related to reading to be particularly useful for school practice" (p. 40).

Studies of Visual Skills

Goins (1958) administered 14 tests of visual perception (developed by Dr. Thelma G. Thurstone) to 120 first-grade children. The tests included no material of a verbal nature; none of the tests utilized letters or words. Tests that were purported to measure

speed of perceptual discrimination, closure, visual memory of perceived forms, reversals, and visual space perceptions were included. A wide range of individual performance was evident from the frequency distributions obtained on each of the visual perception tests. Pattern copying, reversals, and the total perception score predicted reading success more accurately than did intelligence test scores.

The purpose of Barrett's (1965b) study was to determine the ability of nine reading readiness factors (seven requiring varying degrees of visual discrimination) to predict first-grade reading achievement. Chronological age and intelligence were the other two factors. A number of the tasks requiring visual discrimination were more valuable predictors of first-grade reading than IQ.

Barrett (1965a) reviewed the literature concerned with the relationship between measures of pre-reading visual discrimination and first-grade reading achievement. In general, he indicated that further research was needed before definite answers could be given to some fundamental questions about visual discrimination and reading readiness. Larsen and Hammill (1975) reviewed the research exploring the relationship of visual discrimination, spatial relations, memory, and auditory-visual integration to learning (reading, arithmetic, and spelling). They looked at 60 studies which used correlational statistical procedures and involved mainly the primary grades. Their work led them to cast doubt on the importance of visual perception to school learning.

Studies Involving Both Auditory and Visual Skills

Some investigators have considered both auditory skills and visual skills and how they relate to various aspects of the reading process. Nila (1953), Benger (1968), and Harrington and Durrell (1955) all found auditory and visual perceptual factors to be important in the learning-to-read stage. Bruininks (1969) concluded from his study of the reading performance of 105 disadvantaged boys "that auditory and visual perceptual skills appear more related to the acquisition of early reading skills than to their subsequent elaboration" (p. 179).

Morency's (1968) longitudinal study of 179 children in a normal school population led her to conclude ". . . that perceptual abilities develop significantly in the first three years of school in a normal population and that these abilities progress individually along lines of modality preference at differing rates in the same individual" (p. 19). In addition she said, "The stage of development in the various modalities and the adequacy of this development to support the learning that is necessary in the early grades is of crucial importance to successful achievement in the early grades" (p. 20). Consequently, she recommended grouping children for reading instruction according to modality preference. Morency utilized the Wepman Auditory Discrimination Test, an experimental test for auditory memory using consonant-vowel nonsense syllables, experimental tests for visual memory and discrimination that incorporated the use

of geometric forms, Lorge-Thorndike Group Intelligence Test, and Metropolitan Readiness and Achievement Tests.

Wolpert's (1970) findings indicated that most children do exhibit intra-individual differences in sensory modality functioning in learning to read common words. The subjects in his study were suburban first-grade children. Cooper (1971) reached similar conclusions in his study of good and poor first-grade readers. Morency's work is therefore corroborated.

In a later study, Morency and Wepman (1973) sought to determine "whether the level of perceptual processing at which a child begins school continues to affect his learning after the perceptual process itself has fully developed, that is, after the age of nine" (p. 324). She calculated the coefficients of correlation between scores on first-grade perceptual tests and achievement tests in grades four, five, and six. She found that auditory and visual perceptual abilities were related to almost every subtest of the Metropolitan Achievement Tests. Thus, she stressed the need for early identification of children who exhibit a difference in the development of their pathways for learning so that they can be instructed via their more adequate modality.

Barrett's (1967) purposes were to ascertain if there was a correlation between first-grade reading achievement and each of seven prereading tasks and to find the predictive relationship between these tasks in combination and first-grade reading achievement. The prereading abilities were measured by the second

experimental edition of the Clymer-Barrett Prereading Battery and included measures of auditory and visual skills. Barrett felt that the battery would help teachers make decisions about children's readiness for reading, but that it should be considered as a supplement to teacher observation and judgment. He suggested the investigation of the ability of these tasks to predict achievement when different methods of instruction are employed.

deHirsch, Jansky, and Langford (1966) studied 30 boys and 23 girls who were of average intelligence, had no severe emotional problems, presented no significant sensory deficits, and came from homes in which English was the predominant language spoken. They took the position that "a child's perceptuomotor and language level at kindergarten age forecasts his later performance on such highly integrated tasks as reading, writing, and spelling" (p. 13). Thirty-seven kindergarten tests were used to assess this level. Eleven of the kindergarten tests were better predictors of reading achievement at the end of grade two than intelligence. Among others these 11 included the Wepman Auditory Discrimination Test, Horst Reversals Test, Word Matching, and Word Rhyming.

The authors had several contacts with the 53 children over a two and a half year time span. They made some clinical observations which were in addition to the primary aims of their investigation. They compared performance on four tests of auditory-perceptual organization and four tests of visual-perceptual competence. Nineteen percent of the children showed a marked superiority in one

modality as compared to the other. Examination of the reading achievement scores and the methods by which these children had been taught to read led deHirsch et al. (1966) to say, "Approaches to teaching should depend on the individual child's strengths and weaknesses in the different modalities" (p. 83).

Studies Which Attempted to Match Modality and Reading Method

If visual and auditory perceptual skills are important at the early stages of learning to read, and if adequacy in these skills differs within and among children, it is logical that they should be taken into consideration when methods of instruction are being considered. The following studies were undertaken to determine the effectiveness of individualizing instruction according to the stronger, more adequate, or preferred modality of the learner. A paucity of research related to beginning reading exists in this area. Some studies have been included which dealt with older children.

Bateman (1968) gave eight kindergarten classes the Detroit Group Intelligence Scale and the Metropolitan Reading Readiness Test; four of these classes were also given the Illinois Test of Psycholinguistic Abilities (ITPA). Assignment to first grade classes was made on the basis of these tests. Of the four classes who were not tested with the ITPA, two received auditory method reading instruction and two received visual method instruction. Based on their performance on two subtests of the ITPA, the children in the

other four classes were considered either auditory or visual subjects. The auditory method was used for 24 auditory and 24 visual subjects; the visual method was used for 20 auditory subjects and 19 visual subjects. According to Bateman:

> The major findings of this study may be very simply stated: auditory method of reading instruction was superior to the visual method for both reading and spelling; the auditory-modality-preferred were superior in both reading and spelling to the visual-modality-preferred subjects and there was no interaction between the subjects' preferred modality and the method of instruction used. (p. 110)

Bruininks (1970) administered six auditory and six visual perception tests, which he felt measured abilities considered important to early reading skills, to 105 disadvantaged third-grade boys. From this group he obtained two groups of 20 boys; one group demonstrated visual strengths and auditory weaknesses and the other group had the opposite perceptual pattern. Using teaching procedures similar to the Mills Learning Methods Test (Mills, 1964), each subject was taught to recognize 15 unknown words by a sight-word (visual) teaching procedure and a phonic (auditory) method. Bruininks found that use of a teaching method consistent with the perceptual strengths of these children failed to facilitate their learning to recognize and retain a list of unknown words. Therefore he felt that at the upper primary level the concept of matching a disadvantaged child's modality strength to a method of teaching reading has limited value for remedial reading.

First-grade children were the subjects in Ringler, Smith, and Cullinan's (1971) study "to investigate the feasibility of identifying

modality preferences of first-grade children and to determine the relationship between preferred learning modalities, differentiated presentation of reading tasks, and word recognition" (p. 4). In their study, the New York University Modality Test was used to identify preferred modalities (auditory, visual, or kinesthetic). Children were randomly assigned to four groups and a control group each of which therefore contained no preference, auditory preference, visual preference, and kinesthetic preference children. Modes of presentation were auditory, visual, or kinesthetic, and a combination of these three. Children in the three experimental groups received approximately seven and one-half hours of instruction using one of the four methods. The control group did not receive any special instruction. All children participated in the regular classroom reading lessons. Analysis of results of testing with a criterion test (pretest and posttest) of word recognition revealed that there was no significant difference between the scores of the pupils taught by a method corresponding to their modality preference and those pupils taught by a method that did not correspond to their preference.

Four subtests of the Illinois Test of Psycholinguistic Abilities were administered by Waugh (1973) to second graders who were then classified as auditory or visual learners. Findings indicated that the subjects showing greatest preference for the visual mode did equally well on auditory and visual tasks and auditory

learners performed as well on the auditory as on the visual tasks used in this study.

The Illinois Test of Psycholinguistic Abilities and a battery of 18 additional modality tests were used to group fourth-grade children as high auditory, low auditory, high visual, or low visual learners by Newcomer and Goodman (1975). An associative learning task and a meaningful learning task were presented by a visual and an auditory means. Results did not lend support to the Aptitude Treatment Interaction (ATI) approach for normal fourth-grade students.

Another effort to establish support for the ATI paradigm was a study done by Sabatino and Dorfman (1974). This time the subjects were educable mentally retarded children. Tests used to determine auditory, visual, and nonpreference subjects were the Beery-Buktenica Developmental Test of Visual-Motor Integration and the auditory recognition subtest of the Test of Auditory Perception. The Sullivan Programmed Reading Series was used for the curriculum stressing the visual modality and Reading I of the Direct Instructional System for the Teaching of Arithmetic and Reading (DISTAR) was used for the auditory approach. Analysis of data revealed that the auditory learners did not perform significantly better when using the auditory materials than the visual learners; the visual learners did not learn significantly more when using visual materials than the auditory learners; the nonpreference subjects did not respond as well to either intervention as the children who had been designated as having a modality strength.

Second graders were deemed stronger in one modality than the others (auditory, visual, or kinesthetic) on the basis of three sample lessons presented by the three modes in Vandever and Neville's (1974) study. Six groups were formed, a strong and a weak group for each modality. Over a six week period the children were taught words by procedures as modality pure as possible in the author's judgment. They stated, "There were no differences between visual, auditory, and kinesthetic treatments in the number of words learned, nor were there any differences between those taught to their strength and those taught to their weakness" (p. 199).

Sight words were taught to ten auditory and ten visual subjects (average age 114 and 116 months, respectively) through methods designed to be predominantly auditory or visual in a study reported by Foster, Reese, Schmidt, and Ohrtman (1976). Subjects were evaluated with two experimental measures, the Test of Auditory Perception and the Multiple Choice Bender. Noting the limitations of their study, these researchers said that it seemed "that the visual subjects were handicapped under auditory treatment conditions" (p. 256). The auditory subjects seemed to learn equally well with either method.

Robinson (1972) is often cited by other researchers. Her study involved first-grade subjects grouped as high visual-high auditory, low visual-low auditory. These children were followed through the third grade. A sight method approach (Scott, Foresman or Ginn) and a phonic approach (Lippincott) were used to teach beginning reading. Visual perception was evaluated by three of

Goins' tests; auditory discrimination was tested with the Wepman Auditory Discrimination Test. Among other conclusions, Robinson observed that in both first and third grades, "Neither a phonic or a sight method of teaching reading proved to be significantly more effective with children who exhibited the most marked differences in visual or auditory modalities" (p. 35).

Only one study, Bursuk (1971), was located which yielded results to support the modality concept of differentiated instruction of ATI for reading instruction. However, this study involved adolescent retarded readers and the use of either a combined aural-visual approach or a predominately visual approach. Modalities were determined by the Sequential Tests of Educational Progress, Reading Test and Listening Test. Reading comprehension improvement was the concern of this investigation.

Limitations of some of these studies have been noted by their authors and by other researchers. Bateman's study (1968) has been criticized by Robinson (1972) who said that the groups of subjects were atypical because their mean IQ's were from 121-127. Robinson also felt that Bateman's method for classifying modality groups was questionable. Fault was found (Newcomer & Goodman, 1975) with the Bateman (1968) and Waugh (1973) studies for using only selected subtests from the ITPA to determine modality preferences. Cooper (1972) was critical of Bateman's (1968) and Robinson's (1972) studies. He felt that the teaching procedures used were not purely visual and auditory procedures. Aaron (1968) points out the method of

identifying preferences and the treatment as being weak in Bateman's (1968) work. Bruininks (1970) also feels that there were methodological weaknesses in Robinson's (1972) and Bateman's (1968) studies. The instruments used for determining modality by Bateman (1968) and Sabatino and Dorfman (1974) are questioned by Foster, Reese, Schmidt, and Ohrtman (1976). They also stated, in regard to these two studies, "We suggest that the use of commercially prepared reading programs in modality preference research does not permit sufficient control over cross-modality combination in treatments" (p. 254).

Summary

It is apparent from the preceding presentation of the literature that despite the fact that there are indications that matching mode of presentation to the modality preference of the learner should result in more effective learning, research has not borne out this hypothesis. Comparisons of the various studies done in this area is made difficult for the following reasons: (a) subjects varied in age and intelligence levels as well as socioeconomic levels; (b) many different tests were used to determine modality, and the criteria for inclusion in preference groups varied; (c) length of time for the treatments varied; (d) the aspect of the reading process under consideration differed.

Chapter III

Design of the Study

Purpose

The purpose of this study was to examine the results of an effort to select an approach to first-grade reading for each child in accordance with his modality strength as determined by an informal modality test.

Research Questions and Hypotheses

In accordance with the belief that individual children have different learning aptitudes and should be instructed in a manner which will capitalize on their strengths, first-grade children were placed in classrooms using materials which emphasized their stronger modality. Children were designated as auditory, visual, and auditory-visual pupils (those who did not demonstrate a particular strength according to the criterion used for placement) on the basis of their scores on an informal modality test.

The Harper and Row Basic Reading Program was used to teach the visual pupils, and the Open Court Correlated Language Arts Program was used to teach the auditory pupils. Auditory-visual pupils were instructed with either the Harper and Row Basic Reading Program or the Open Court Correlated Language Arts Program depending on classroom placement. Stanford Achievement Test scores were used

to determine achievement in first-grade reading. The following questions were posed and hypotheses formulated regarding the aforementioned groups:

Questions

1. Were the visual pupils reading at a minimum 1.5 grade level at the end of first grade?

2. Were the auditory pupils reading at a minimum 1.5 grade level at the end of first grade?

3. Were the auditory-visual pupils using the Harper and Row Basic Reading Program reading at a minimum 1.5 grade level at the end of first grade?

4. Were the auditory-visual pupils using the Open Court Correlated Language Arts Program reading at a minimum 1.5 grade level at the end of first grade?

5. For each of the four groups and for the total group, what are the best predictors of first-grade reading achievement? The following were considered: Peabody Picture Vocabulary Test score, Metropolitan Readiness Tests (Pre-Reading Skills Composite) score, the total score on the auditory portion of the informal modality test, and the total score on the visual portion of the informal modality test.

6. For each of the four groups and for the total group, which of the items on the informal modality test are the best predictors of first-grade reading achievement?

Hypotheses

1. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory group and the visual group.

2. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory group and the auditory-visual group using the Open Court Correlated Language Arts Program.

3. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the visual group and the auditory-visual group using the Harper and Row Basic Reading Program.

4. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory-visual group using the Harper and Row Basic Reading Program and the auditory-visual group using the Open Court Correlated Language Arts Program.

Methodology

Subjects

The subjects were 60 children, 26 girls and 34 boys, who were attending a public school in a middle class suburban community. The children were completing kindergarten at the beginning of the study and first grade at its conclusion. Their ages ranged from five years and seven months to seven years; their intelligence quotients, as determined by the Peabody Picture Vocabulary Test, ranged from 95 to 145.

Instruments

Tests used to assess reading readiness abilities at the end of the kindergarten year were: the Metropolitan Readiness Tests

(Level II, Form P), Peabody Picture Vocabulary Test, and an informal modality test. The Stanford Achievement Test (Primary Level I Battery, Form A) was given at the end of the first grade to determine reading achievement.

The informal modality test consisted of seven subtests related to visual perception and six subtests related to auditory perception. Over a period of a few years, several reading resource teachers sought to devise a test to assess visual and auditory perceptual abilities. Gradually the test used in this study evolved. Some of the subtests were selected from published tests and some were teacher-adapted.

More than 50 published tests, including readiness tests, intelligence tests, and sensory-motor tests, were examined in an attempt to identify the source of each subtest. Following is a list of the subtests indicating the type of test and its source as nearly as it could be determined. The numbers in parentheses indicate the total possible score for each subtest.

Subtest	Name	Source
A-1	Auditory Discrimination (10)	Adaptation of the Wepman Auditory Discrimination Test
A-2	Auditory Memory for Sentences (27)	Detroit Tests of Learning Aptitude
A-3	Auditory Memory for Unrelated Words (30)	Detroit Tests of Learning Aptitude
A-4	Rhyming (12)	Teacher-adapted
A-5	Blending (12)	Teacher-adapted

Subtest	Name	Source
A-6	Oral Directions (13)	Detroit Tests of Learning Aptitude
V-7	Visual Discrimination (8)	Adaptation of Test II, Visual Discrimination of Word Forms, on Beth H. Slingerland's Pre-Reading Screening Procedures
V-8	Visual Memory for Letters and Numbers (20)	Teacher-adapted
V-9	Word Matching (10)	Adaptation of Gates Reading Readiness Tests
V-10	Copy Forms (24)	Same figures as those on the Developmental Test of Visual-Motor Integration
V-11	Disarranged Pictures (24)	Detroit Tests of Learning Aptitude
V-12	Copy a Sentence (8)	Clymer-Barrett Pre-Reading Battery
V-13	Horst Reversal (10)	Horst Test

As indicated above, there are different possible scores for each of the subtests. However, the combined total possible score for the six auditory subtests is 104 and the combined total possible score for the seven visual subtests is 104.

Procedures

During a one week period in May 1976, all of the 93 children in kindergarten were given three tests, the Metropolitan Readiness Tests, Peabody Picture Vocabulary Test, and the informal modality test. The Metropolitan Readiness Tests were administered by the

kindergarten teachers and the Peabody Picture Vocabulary Test was given by the reading resource teacher. The reading resource teacher, a reading teacher, and an aide were involved in the administration of the informal modality test. Any tests which might involve subjective judgment (V-10 and V-12) were given by the reading resource teacher.

Eleven children whose performance on these tests combined with observations of the kindergarten and reading resource teachers indicated that they would probably experience much difficulty with the regular first-grade reading materials, were assigned to a slower-paced reading program. Five children were placed in classrooms on the basis of personality needs or parental requests. Seventeen children left the school before the end of first grade. Sixty children remained as subjects for this study.

On the basis of their scores on the auditory and visual perception tests (the informal modality test), 26 of the children were assigned to first-grade classrooms utilizing materials which emphasized their stronger modality. The remaining 34 children were assigned to classrooms in the usual manner employed by school personnel.

A child was designated as having strength in one modality or the other if the difference between his auditory and visual scores was ten points or more. Only one of the 26 children who indicated a stronger modality had as few as ten points between his scores as can be seen in the summary of scores in Appendix A.

Two basal reading programs were in use in the school, the Harper and Row Basic Reading Program and the Open Court Correlated Language Arts Program. The Harper and Row Basic Reading Program was selected for use with the children who scored ten points or more higher on the visual portion of the informal modality test and the Open Court Correlated Language Arts Program was used with children who scored ten points or more higher on the auditory portion of the test.

The Harper and Row Basic Reading Program utilizes an analytic approach to phonics and a number of visual devices to help children learn new words. Devices used at the preprimer level to develop proficiency in independent word attack are the rebus, label words, and pictured rhyming words. The rebus is a picture which is used to represent a word which is not yet a part of the pupil's basic reading vocabulary. Label words are words placed next to an object in an illustration and repeated in the accompanying text. These words are in addition to the basic reading vocabulary of 78 words introduced in the four preprimers. In the fourth preprimer rhyming words are presented in picture-dictionary style.

In the primer, there are pages called "Helping Yourself with New Words" which present new words in a picture dictionary. These words are underlined in the story so that the child can refer to the picture dictionary to unlock the meaning of the word by himself.

In the first reader, the picture dictionary is used and two more self-help devices are added, "Words You Can Get by Yourself"

and "Let the Sentences Help You." In the "Words You Can Get by Yourself" section, new words are presented along with words which are already a part of the child's basic reading vocabulary. Through consonant substitution, word structure clues, or work with compound words, the student can decode the new word by comparing it with the old; context clues are emphasized in the "Let the Sentences Help You" section.

The Open Court Correlated Language Arts Program stresses a synthetic phonics approach to reading. According to the publisher's catalogue, "The children learn to read by first learning how letters sound and how the sounds blend together into words and sentences" (p. 7).

Part of the Open Court Foundation Program is the sequential introduction of all the main sounds of the English language. Starting with the first lesson, blending skills are taught in a systematic way. In each lesson the progression is from sound to word to sentence. By approximately the middle of first grade the forty-three main sounds have been introduced and practiced.

The Open Court Foundation Program includes two basic Reader Workbooks and 12 short supplementary storybooks. The vocabulary in these books is consistently phonically-predictable so that children can routinely sound out words they do not recognize. A number of irregular spelling patterns are introduced near the end of the Open Court Foundation Program in preparation for the next reader containing vocabulary which are exceptions to phonic generalizations.

While neither of the two programs described above could be called totally visual or totally auditory, the Harper and Row Basic Reading Program places its emphasis on a whole word approach and visual aids to learning new words while the Open Court materials place a heavy emphasis on the sounds of the English language as an approach to beginning reading.

Three classrooms used the Open Court Correlated Language Arts Program and two classrooms used the Harper and Row Basic Reading Program. In no classroom was more than one approach used. The five teachers involved had experience with and had no objections to the materials which they were using to teach first-grade reading. Approximately two hours each day were used for reading and language arts instruction in each classroom for the entire first-grade year.

In May, 1977, at the end of first grade the Stanford Achievement Test (Primary Level I Battery, Form A) was administered by the first-grade teachers. The total score for word reading and paragraph reading (A + B) was selected for use in this study.

Statistical Analysis

After all scores were obtained, data for each subject in the four groups were listed on master data sheets. Data included scores on the Peabody Picture Vocabulary Test, the auditory portion of the informal modality test, the visual portion of the informal modality test, the total score on the informal modality test, the Metropolitan Readiness Tests (Pre-Reading Skills Composite) score, and the Stanford Achievement Test reading scores (A + B). See Appendix A.

An unweighted means solution of a 2 x 2 factorial analysis of variance was used to determine if Peabody Picture Vocabulary Test scores (IQ) differed significantly among the groups. No statistically significant differences were found.

Scores on the Stanford Achievement Test (A + B) given at the end of first grade were used to answer questions one through four. If a child's reading score on the Stanford Achievement Test (A + B) was a minimum 1.5 grade level or above, he was considered to have reached at least minimum competency in first grade. This is the criterion used by school personnel to determine eligibility for the program for Pupils with Special Educational Needs (Section 241 of New York State Education Finance Laws).

An analysis of variance was used to determine the significance of the differences of the mean scores on the Stanford Achievement Test reading scores (A + B) among the four groups, auditory, visual, and the two auditory-visual groups. Results of this analysis were used to make a decision regarding hypotheses one through four.

Questions five and six were investigated by calculating the Pearson product-moment correlation coefficient (Pearson r) for the Stanford Achievement Test reading score (A + B) and the following: Peabody Picture Vocabulary Test score, the Metropolitan Readiness Tests (Pre-Reading Skills Composite) score, the total score on the auditory portion of the informal modality test, the total score on the visual portion of the informal modality test, and the raw scores for each subtest on the informal modality test.

Summary

Sixty children in a suburban school were given readiness tests prior to entering first grade. Their placement in beginning reading programs which emphasized either an auditory or a visual approach was dependent on their performance on an informal modality test. The children's reading achievement was assessed at the end of first grade, and comparisons were made among the four groups: auditory, visual, and two auditory-visual.

Chapter IV

Analysis of Data

Purpose

The purpose of this study was to examine the results of an effort to select an approach to first-grade reading for each child in accordance with his modality strength as determined by an informal modality test.

A number of questions were posed and hypotheses formulated in order to determine the effectiveness of administering an informal modality test and subsequently placing children in first-grade reading materials which emphasized their stronger modality, either auditory or visual. There were four groups of children in the study. The groups were designated as auditory, visual, and auditory-visual (two groups). The Open Court Correlated Language Arts Program was used to instruct one auditory-visual group and the auditory group; the Harper and Row Basic Reading Program was used to instruct one auditory-visual group and the visual group. Stanford Achievement Test reading scores (A + B) were used to determine first-grade reading achievement.

Questions

1. Were the visual pupils reading at a minimum 1.5 grade level at the end of first grade?

2. Were the auditory pupils reading at a minimum 1.5 grade level at the end of first grade?

3. Were the auditory-visual pupils using the Harper and Row Basic Reading Program reading at a minimum 1.5 grade level at the end of first grade?

4. Were the auditory-visual pupils using the Open Court Correlated Language Arts Program reading at a minimum 1.5 grade level at the end of first grade?

5. For each of the four groups and for the total group, what are the best predictors of first-grade reading achievement? The following were considered: Peabody Picture Vocabulary Test score, Metropolitan Readiness Tests (Pre-Reading Skills Composite) score, the total score on the auditory portion of the informal modality test, and the total score on the visual portion of the informal modality test.

6. For each of the four groups and for the total group, which of the items on the informal modality test are the best predictors of first-grade reading achievement?

Hypotheses

1. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory group and the visual group.

2. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory group and the

auditory-visual group using the Open Court Correlated Language Arts Program.

3. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the visual group and the auditory-visual group using the Harper and Row Basic Reading Program.

4. There is no significant difference between the Stanford Achievement Test reading scores (A + B) of the auditory-visual group using the Harper and Row Basic Reading Program and the auditory-visual group using the Open Court Correlated Language Arts Program.

Findings and Interpretations

Questions one through four inquired if the children in each of the four groups (auditory, visual, and two auditory-visual groups) were reading at a minimum 1.5 grade level at the end of first grade. An examination of the scores for each individual revealed the information presented in Table 1.

Table 1

Number of Children in the Auditory, Visual, and Auditory-Visual Groups Reading at a Minimum 1.5 Grade Level

Groups	n	No. at or above 1.5 Grade Level	%
Using Harper and Row			
Auditory-Visual	8	5	63
Visual	17	12	71
Using Open Court			
Auditory-Visual	26	26	100
Auditory	9	6	67

Of the 60 children with average or above average intelligence who were subjects for this study, 11 were not reading at a minimum grade level of 1.5 at the end of first grade. An examination of individual scores on the auditory and visual portions of the informal modality test disclosed that of these 11 children, eight scored below the mean for the entire group of 60 children on the auditory portion of the informal modality test and nine scored below the mean for the entire group of 60 on the visual portion. Six of these children scored below the mean for the total group on both the auditory and visual parts of the test. However, no definite pattern emerged regarding these 11 children.

Question 5 sought to determine if there was a correlation between first-grade reading achievement and each of the following: Peabody Picture Vocabulary Test score, Metropolitan Readiness Tests (Pre-Reading Skills Composite) score, the total score on the auditory portion of the informal modality test, and the total score on the visual portion of the informal modality test. Table 2 shows the results of calculating the Pearson product-moment correlation coefficient (r) for the Stanford Achievement Test reading score (A + B) and each of the tests mentioned for the four groups and for the total group.

Table 2

Pearson Product-Moment Correlations of Kindergarten Screening Tests with Stanford Achievement Test Reading Scores (A + B) for the Auditory, Visual, Two Auditory-Visual Groups, and the Total Group

Kindergarten Screening Tests	A (n=9) OC	V (n=17) HR	A-V (n=8) HR	A-V (n=26) OC	Total Group (n=60)
Metropolitan	.393	.446	.457	.464*	.448**
Peabody	.193	.167	.209	.024	.164
Auditory	.503	.667**	.563	.364	.498**
Visual	.630	.550*	.680	.322	.409**

*$p < .05$

**$p < .01$

The Metropolitan Readiness Tests (Pre-Reading Skills Composite) and the auditory and visual scores on the informal modality test were found to be significant predictors of first-grade reading achievement for the total group of 60 children. Fisher's r to z transformation was used to determine whether or not the significant correlations between the Stanford Achievement Test reading score (A + B) and those three tests were significantly different from one another. No significant differences were found ($zs < 1.96$, $p > .05$). Similarly, no significant differences were found between the significant correlations of the Stanford Achievement Test reading score (A + B) and the auditory and visual tests for the visual group ($zs < 1.96$, $p > .05$).

Table 3 shows the results of calculating the Pearson product-moment correlation coefficient for the Stanford Achievement Test reading score (A + B) and the raw score on each subtest of the informal modality test.

Table 3

Pearson Product-Moment Correlations of the Stanford Achievement Test Reading Scores (A + B) with the Subtests of the Informal Modality Test for the Auditory, Visual, Two Auditory-Visual Groups, and Total Group

Subtests of Informal Modality Test	A (n=9) OC	V (n=17) HR	A-V (n=8) HR	A-V (n=26) OC	Total Group (n=60)
A-1	.145	.274	.637	.205	.295*
A-2	-.011	.425	.442	.345	.315*
A-3	.199	.425	.101	.233	.289*
A-4	.193	.354	.140	.036	.227
A-5	.701*	.708**	.711*	-.039	.447**
A-6	.554	.072	-.580	.306	.299**
V-7	.451	.226	.376	.133	.226
V-8	.602	.251	-.100	.105	.227
V-9	.636	.481*	.542	.135	.350**
V-10	.620	.628**	.928**	.177	.385**
V-11	-.032	.200	.589	.277	.201
V-12	.291	.241	.291	.136	.224
V-13	.337	.338	-.077	.220	.263**

*$p < .05$
**$p < .01$

The only significant predictor of first-grade reading achievement for the auditory group was subtest A-5, Blending. For the visual group subtests A-5, V-9, and V-10 or Blending, Word Matching, and Copy Forms, respectively, were significant predictors of reading achievement in first grade. There were two significant predictors for the auditory-visual group using the Harper and Row Basic Reading Program, A-5, Blending and V-10, Copy Forms. There were no significant predictors for the auditory-visual group using the Open Court Correlated Language Arts Program. Significant predictors of first-grade reading achievement for the total group were the following subtests: A-1, Auditory Discrimination; A-2, Auditory Memory for Sentences; A-3, Auditory Memory for Unrelated Words; A-5, Blending; A-6, Oral Directions; V-9, Word Matching; V-10, Copy Forms; and V-13, Horst Reversal.

Fisher's r to z transformation was used to determine if the significant correlations between the Stanford Achievement Test reading score (A + B) and the visual subtests for the visual group and the total group were significantly different. No significant differences were found in any instance (zs < 1.96, p > .05). Using the same statistical procedure, no significant differences were found for the significant correlations between the Stanford Achievement Test reading score (A + B) and the auditory subtests of the informal modality test.

Hypotheses one through four were investigated using a two-way analysis of variance (program x group). Figure 1 represents the four groups and the programs used for their instruction.

Program	Groups: Placed According to Modality Strength	Groups: Arbitrarily Placed
Harper and Row	Visual Pupils n=17	Auditory-Visual Pupils n=8
Open Court	Auditory Pupils n=9	Auditory-Visual Pupils n=26

Figure 1. Number of subjects and organization of groups.

Table 4 shows the summary table for the analysis of variance comparing the Stanford Achievement Test reading scores (A + B) of the subjects in each of the four cells in Figure 1.

Table 4

Results of Analysis of Variance for Auditory, Visual, and Two Auditory-Visual Groups on Stanford Achievement Test Reading Scores (A + B)

Source	df	SS	MS	F	p
Groups (Placed According to Modality Strength/ Arbitrarily Placed)	1	0.036	.036	< 1	NS
Program (HR/OC)	1	2.185	2.185	1.84	NS
Group x Program	1	0.924	0.924	< 1	NS
Error	56	66.460	1.186		NS
Total	59				

The main effects of groups and program were not statistically significant ($p > .05$); and the interaction effect (program x group) was not statistically significant ($p > .05$). Therefore the findings in Table 4 fail to reject null hypotheses one through four.

Summary

Examination of the Stanford Achievement Test scores (A + B) revealed that, with the exception of the auditory-visual group using the Open Court Correlated Language Arts Program, some children in each group were not reading at a minimum 1.5 grade level at the end of first grade. An analysis of variance of the Stanford Achievement Test scores (A + B) for the auditory, visual, and two auditory-visual groups indicated that there were no significant differences in performance among the four groups.

Results of calculating the Pearson product-moment correlations of the Stanford Achievement Test reading score (A + B) with the four kindergarten screening tests showed significant correlations between first-grade reading achievement and the Metropolitan Readiness Tests, the auditory portion of the informal modality test, and the visual portion of the informal modality test for the total group of 60 children. For the individual groups, the auditory and visual portions of the informal modality test were significant predictors of reading achievement for the visual group, and the Metropolitan Readiness Tests score was a significant predictor for the auditory-visual group using the Open Court Correlated Language Arts Program.

When the Pearson product-moment correlations of the Stanford Achievement Test with the auditory subtests were calculated, it was found that subtests A-1, A-2, A-3, A-5, and A-6 were significant predictors of end of first-grade reading achievement for the total group, but only subtest A-5 was a significant predictor for any of the individual groups. On the visual portion of the modality test, subtests V-9, V-10, and V-13 were significant predictors for the total group and V-10 was a significant predictor for the auditory-visual group using the Harper and Row Basic Reading Program.

Chapter V

Conclusions and Implications

Conclusions

Despite average intelligence and an approach to beginning reading selected for each individual to match his modality strength as determined by the informal modality test, some children experienced difficulty learning to read. As previously stated, reading is a complex process. For each child who experienced difficulty, there are, of course, a myriad of possible reasons in addition to the readiness factors considered by this study.

On the basis of the evidence available, it is not possible to say that the approach to reading instruction used to teach those who failed to reach a minimum 1.5 grade level was the predominant reason for their poor achievement. The Harper and Row Basic Reading Program was equally effective for the visual pupils and the auditory-visual pupils, and the Open Court Correlated Language Arts Program was equally effective for the auditory pupils and the other group of auditory-visual pupils.

It should be noted that the children were classified as auditory or visual pupils strictly on the basis of a ten point differential between their total scores on the auditory and visual subtests of the informal modality test. It was not statistically determined if this magnitude of difference is sufficient to

differentiate between children's learning modes. Additionally, a child whose scores were 68 and 78 would not have the same degree of strength as one whose scores were 88 and 98. There were 26 children (43%) who were placed according to modality. This number is considerably higher than the percentage of children found by researchers to have modality deficits. However, it should be emphasized that the purpose of this plan for assigning children to first-grade reading materials was to maximize every child's learning by instructing him with materials with which he would have the greatest facility. The purpose was not to select only those children with modality deficits.

In order to determine if one of these two approaches to teaching beginning reading is more effective for children with visual strengths or for those with auditory strengths, assignment of both visual and auditory pupils to both approaches would have to be made, and results analyzed. This study indicates that neither approach was superior for the auditory-visual pupils. The auditory pupils did as well as the auditory-visual pupils using Open Court, and the visual pupils were as successful as the auditory-visual pupils using Harper and Row. This outcome could be because the children were appropriately placed or because the approaches did not actually differ greatly.

Perhaps synthetic (part to whole) and analytic (whole to part) are more accurate terms than auditory and visual to describe the two approaches utilized. The Open Court Correlated Language

Arts Program would represent the synthetic approach and the Harper and Row Basic Reading Program the analytic. Mills (1964) stated, "It should be understood that there is no pure method or approach to the teaching of word recognition. All words have visual, phonic, and kinesthetic elements which cannot be divorced completely from each other" (p. 28).

The 11 children who did not reach the minimum 1.5 grade level on the reading achievement test were not consistently the poorest performers in their groups on the auditory and visual portions of the informal modality test. Of these 11 children, two who were in the visual group had the two lowest scores for their group on the auditory portion of the test and one of these children also had the lowest score on the visual test. In the auditory group none of those pupils who were not reading at a minimum 1.5 grade level had the lowest score for that group on either portion of the modality test. One of the poor achievers in the auditory-visual group using Harper and Row materials had the lowest scores for his group on both parts of the test. No test score pattern was evident regarding the children who experienced difficulty with first-grade reading. In other words, children with higher scores and children with lower scores than the 11 poor performers did achieve a score of 1.5 or better on the reading achievement test at the end of first grade. Thus, modal factors cannot be the only reason for the failure of some children in this group to become successful readers. Because

of the small number of children in each group, generalizations to a larger population are not warranted.

The Peabody Picture Vocabulary Test scores of the pupils who experienced difficulty ranged from 97 to 145. Other children with similar scores successfully learned to read. For this group there was no apparent relationship between skills measured by the informal modality test and intelligence.

Five of the six auditory subtests and three of the seven visual subtests were significant predictors of first-grade reading achievement for the total group. These were the Auditory Disrimination, Auditory Memory for Sentences, Auditory Memory for Unrelated Words, Blending, Oral Directions, Word Matching, and Copy Forms subtests. Comparisons with the results of previous research were difficult to make because many of the tests on the informal modality test have not been used in studies which have attempted to determine predictors of first-grade reading achievement.

Unfortunately, there were fewer instances of significant correlations for the individual groups. This was probably due in part to the small number of children in each group. Subtest A-5, Blending, was a predictor for the auditory group; V-9, and V-10 or Word Matching and Copy Forms, were predictors for the visual group; and V-10 was a predictor for the auditory-visual group using Harper and Row.

This writer feels that these tests could most profitably be used by the educator if they were considered as diagnostic rather

than predictive. They do provide information which is in addition to that provided by the Metropolitan Readiness Tests and the Peabody Picture Vocabulary Test.

Results of calculating correlations of the Stanford Achievement Test reading score (A + B) with the kindergarten screening tests indicated that the Metropolitan Readiness Tests score and the auditory and visual scores on the informal modality test were significant predictors of first-grade reading achievement. Some of the skills measured by the Metropolitan Readiness Tests and the informal modality test are similar. For instance, Visual Matching and Finding Patterns on the Metropolitan are similar to the Visual Discrimination and Word Matching subtests of the informal modality test. However, most of the subtests on these two instruments are quite different. This suggests that the modal factors evaluated by the informal modality test might be important for beginning readers to possess.

Implications for Research

Research concerning modalities and reading has been concerned with specific subskills of the reading process such as word recognition as well as broad categories such as comprehension. Frequently the preferred modality of the pupil has not been a consideration of attempts to determine a superior mode of presentation. There is a need to determine which specific skills, if any, might be most efficiently taught by matching the learner's modality aptitude with the mode of presentation. It would seem that the activity used to

determine preferred modality should closely resemble the manner in which a particular skill is to be taught.

Attempts to determine relationships between a pupil's learning style and instruction are confounded by the present lack of agreement about what skills should be assessed to determine modality preference. This writer is aware of no highly valid tests of modality preference. This would be a fruitful area for further investigations.

Additional information concerning what constitutes a definite inability to learn a skill by a particular mode is needed. Because a child has strength in one area does not necessarily mean that he will not learn easily by whatever approach is used. Blanton (1971) made a number of observations about modalities and reading. One of them is the following:

> . . . in addition to the fact that it is virtually impossible to isolate any aspect of reading behavior where the auditory and visual modalities are not involved to some degree, there are a number of studies suggesting that mode of presentation does not determine the modality by which material is learned. Rather, the mental image is determined by the ideational type of the individual. In other words, the visual learner may still visualize material to be learned despite the fact that it is presented auditorially. (p. 211)

Finally, if future research strongly indicates that some children do require reading materials that are largely dependent on the use of a particular modality, there will be a need for further development of materials which are more modality specific.

Implications for Classroom Practice

Theoretically, the concept of matching an approach to instruction in beginning reading with the modality strength or preference of the learner seems to offer possibilities for facilitating learning and preventing problems from developing. Research, to date, has given little support to this theory.

Nevertheless, the teacher concerned with meeting the instructional needs of the children in his classroom must make decisions about the appropriate materials to use with each child. It is generally conceded that no single method of teaching reading meets the needs of all children. Given a good teacher, most children learn to read by any approach. It is the few who experience difficulty who are cause for concern. The classroom teacher should be knowledgeable about a number of approaches to beginning reading and have a variety of materials available for use.

It would be useful to identify, in the middle of first grade, those children who are failing to make progress with the approach to reading they are using. Sample lessons such as those suggested by Harris and Roswell (1953) might be used to determine a more effective approach, or a modification of the one being used.

Since the auditory and visual perceptual skills are still developing in kindergarten and first-grade children, perhaps evaluation of these skills would be most accurate for planning purposes if done during the first few weeks of first grade prior to the commencement of formal reading instruction.

The classroom teacher should keep abreast of current research findings which might aid him in his efforts to provide for individual differences. As Weintraub (1971) said:

> The teacher, then, must temper the findings of research with what knowledge and insights he has of his own pupils. The wise teacher uses research findings as another aid in helping him reach better decisions. (p. 80)

References

References

Aaron, I. E. Translating research into practice: Reading readiness, visual perception, and auditory perception. In H. K. Smith (Ed.), Perception and reading, Proceedings of the International Reading Association, 1968, 12 (Part 4), 130-135.

Barrett, T. C. The relationship between measures of pre-reading visual discrimination and first grade reading achievement: A review of the literature. Reading Research Quarterly, 1965, 1, 51-76. (a)

Barrett, T. C. Visual discrimination tasks as predictors of first grade reading achievement. The Reading Teacher, 1965, 18, 276-282. (b)

Barrett, T. C. Performance on selected prereading tasks and first-grade reading achievement. In J. A. Figurel (Ed.), Vistas in reading, Proceedings of the International Reading Association, 1967, 11 (Part 1), 461-464.

Bateman, B. The efficacy of an auditory and a visual method of first grade reading instruction with auditory and visual learners. In H. K. Smith (Ed.), Perception and reading, Proceedings of the International Reading Association, 1968, 12 (Part 4), 105-112.

Benger, K. The relationships of perception, personality, intelligence, and grade one reading achievement. In H. K. Smith (Ed.), Perception and reading, Proceedings of the International Reading Association, 1968, 12 (Part 4), 112-123.

Birch, H. G., & Belmont, L. Auditory-visual integration, intelligence and reading ability in school children. Perceptual and Motor Skills, 1965, 20, 295-305.

Blanton, B. Modalities and reading. The Reading Teacher, 1971, 25, 210-212.

Bond, G. L., & Dykstra, R. The cooperative research program in first grade reading instruction. Reading Research Quarterly, 1967, 2, 10-138.

Bond, G. L., & Tinker, M. A. Reading difficulties: Their diagnosis and correction. New York: Appleton-Century-Crofts, 1957.

Bracht, G. H. Experimental factors related to aptitude-treatment interactions. Review of Educational Research, 1970, 40, 627-645.

Bruininks, R. H. Auditory and visual perceptual skills related to the reading performance of disadvantaged boys. Perceptual and Motor Skills, 1969, 29, 179-186.

Bruininks, R. H. Teaching word recognition to disadvantaged boys. Journal of Learning Disabilities, 1970, 3, 28-37.

Bursuk, L. Z. Sensory mode of lesson presentation as a factor in the reading comprehension improvement of adolescent retarded readers. Paper presented at the Annual Convention of the American Educational Research Association, New York, February 1971. (ERIC Document Reproduction Service No. ED 047 435)

Chall, J. S. Learning to read: The great debate. New York: McGraw-Hill Book Company, 1967.

Chester, R. D. The psychology of reading. The Journal of Educational Research, 1974, 67, 403-411.

Cooper, J. D. A study of the learning modalities of good and poor first grade readers. In N. B. Smith (Ed.), Reading methods and teacher improvement. Newark, Delaware: International Reading Association, 1971.

Cooper, J. D. Learning modalities and reading. In L. A. Harris & C. B. Smith (Eds.), Individualizing reading instruction a reader. New York: Holt, Rinehart and Winston, Inc., 1972.

Cronbach, L. J. How can instruction be adapted to individual differences? In R. M. Gagne (Ed.), Learning and individual differences. Columbus: Charles E. Merrill, 1967.

Day, W. P., & Beach, B. R. A survey of the research comparing the visual and auditory presentation of information. Technical Report No. 5921, U. S. Air Force Base Air Material Command, Wright-Patterson Air Force Base, Dayton, Ohio, 1950.

Dechant, E. Why an eclectic approach in reading instruction? In J. A. Figurel (Ed.), Vistas in reading, Proceedings of the International Reading Association, 1967, 11 (Part 1), 28-32.

Dechant, E. V., & Smith, H. P. Psychology in teaching reading. (2nd ed.). Englewood Cliffs, New Jersey: Prentice-Hall, 1977.

de Hirsch, K., Jansky, J.J., & Langford, W. S. Predicting reading failure. New York: Harper and Row, Publishers, 1966.

Durkin, D. Children who read early. Columbia University, New York: Teachers College Press, 1966.

Durrell, D. D., & Murphy, H. A. The auditory discrimination factor in reading readiness and reading disability. Education, 1953, 73, 556-560.

Dykstra, R. Auditory discrimination abilities and beginning reading achievement. Reading research Quarterly, 1966, 1, 5-34.

Foster, G. G., Reese, J. H., Schmidt, C. R., & Ohrtman, W. F. Modality preference and the learning of sight words. The Journal of Special Education, 1976, 10, 253-258.

Freud, S. [On aphasia] (E. Stengel, trans.). New York: International Universities, Press, Inc., 1953. (First published in Germany, 1891).

Frostig, M., & Horne, D. The Frostig program for the development of visual perception (Teacher's guide). Chicago: Follett Publishing Company, 1964.

Gagné, R. M. Instruction and the conditions of learning. In L. Siegel (Ed.), Instruction some contemporary viewpoints. San Francisco: Chandler Publishing Company, 1967.

Glaser, R. Some implications of previous work on learning and individual differences. In R. M. Gagne (Ed.), Learning and individual differences. Columbus: Charles E. Merrill, 1967.

Goins, J. T. Visual perceptual abilities and early reading progress. Supplementary Educational Monographs (No. 87). Chicago: The University of Chicago Press, 1958.

Groff, P. Reading ability and auditory discrimination: Are they related? The Reading Teacher, 1975, 28, 742-747.

Hammill, D. D., & Larsen, S. C. The relationship of selected auditory perceptual skills and reading ability. Journal of Learning Disabilities, 1974, 7, 429-435.

The Harper & Row Basic Reading Program. New York: Harper and Row Publishers, 1966.

Harrington, Sister M. J., & Durrell, D. D. Mental maturity versus perception abilities in primary reading. The Journal of Educational Psychology, 1955, 46, 375-380.

Harris, A. J. Influence of individual differences on the reading program. In H. A. Robinson (Ed.), Meeting individual differences in reading (Proceedings of the Annual Conference on Reading, Vol. 26). Chicago: The University of Chicago Press, 1964.

Harris, A. J. How to increase reading ability (5th ed.). New York: David McKay, 1970.

Harris, A. J., & Roswell, F. G. Clinical diagnosis of reading disability. Journal of Psychology, 1953, 36, 323-340.

Henmon, V. A. C. The relationship between mode of presentation and retention. Psychological Review, 1912, 19, 79-96.

Jensen, A. R. Varieties of individual differences in learning. In R. M. Gagne (Ed.) Learning and individual differences. Columbus: Charles E. Merrill, 1967.

Johnson, D., & Myklebust, H. Learning disabilities. New York: Grune & Stratton, 1967.

Jones, J. P. Learning modalities--Should they be considered? Paper presented at the Annual Convention of the International Reading Association, 1971. (ERIC Document Reproduction Service No. ED 052 899)

Jones, J. P. Intersensory transfer, perceptual shifting, modal preference, and reading. ERIC/CRIER and the International Reading Association Reading Information Series: Where Do We Go? Newark, Delaware: International Reading Association, 1972.

Larsen, S. C., & Hammill, D. D. The relationship of selected visual-perceptual abilities to school learning. The Journal of Special Education, 1975, 9, 281-291

McGeoch, J. A., & Irion, A. L. Psychology of human learning (2nd ed.). New York: Longmans, Green and Co., 1952.

Mills, R. E. The teaching of word recognition including the manual of directions for the learning methods test. Fort Lauderdale, Florida: The Mills Center, 1964.

Morency, A. Auditory modality, research and practice. In H. K. Smith (Ed.), Perception and reading, Proceedings of the International Reading Association, 1968, 12 (Part 4), 17-21.

Morency, A., & Wepman, J. M. Early perceptual ability and later school achievement. The Elementary School Journal, 1973, 73, 323-327.

Neville, D. The development of an instrument to predict modality preference for learning to read. In C. A. Ketcham (Ed.), Proceedings of the College Reading Association (Vol. 11). Fall, 1970.

Newcomer, P. L., & Goodman, L. Effect of modality instruction on the learning of meaningful and nonmeaningful material by auditory and visual learners. The Journal of Special Education, 1975, 9, 261-268.

Nila, Sister Mary. Foundations of a successful reading program. Education, 1953, 73, 543-555.

Open Court Language Arts Catalogue. LaSalle, Illinois: Open Court Publishing Company.

Open Court Correlated Language Arts Program. LaSalle, Illinois: Open Court Publishing Company, 1972.

Ringler, L. H., Smith, I. L., & Cullinan, B. E. Modality preference, differentiated presentation of reading tasks, and word recognition of first-grade children. Paper presented at the 16th Annual Convention of the International Reading Association, 1971. (ERIC Document Reproduction Service No. ED 052 901)

Robinson, H. M. Visual and auditory modalities related to methods for beginning reading. Reading Research Quarterly, 1972, 8, 7-39.

Rosner, J. Perceptual skills--A concern of the classroom teacher? The Reading Teacher, 1971, 24, 543-555.

Sabatino, D. A., & Dorfman, N. Matching learner aptitude to two commercial reading programs. Exceptional Children, 1974, 41, 85-90.

Silverstone, R. A., & Deichmann, J. W. Sense modality research and the acquisition of reading skills. Review of Educational Research, 1975, 45, 149-172.

Singer, H. IQ is and is not related to reading. Paper read at the Annual Convention of the International Reading Association, Denver, Colorado, May 1973. (ERIC Document Reproduction Service No. ED 088 004)

Snyder, R., & Pope, P. Auditory and visual inadequacies in maturation at the first grade level. Journal of Learning Disabilities, 1972, 5, 620-625.

Stephens, T. M. Directive teaching of children with learning and behavioral handicaps. Columbus: Charles E. Merrill, 1970.

Thompson, B. B. A longitudinal study of auditory discrimination. Journal of Educational Research, 1963, 56, 376-378.

Vandever, T. R., & Neville, D. D. Modality aptitude and word recognition. Journal of Reading Behavior, 1974, 6, 195-201.

Waugh, R. P. Relationship between modality preference and performance. Exceptional Children, 1973, 39, 465-469.

Weintraub, S. What research says about learning to read. In H. M. Robinson (Ed.), Coordinating reading instruction. Glenview, Illinois: Scott Foresman, 1971.

Wepman, J. M. Auditory discrimination, speech, and reading. The Elementary School Journal, 1960, 60, 325-333.

Wepman, J. The modality concept--Including a statement of the perceptual and conceptual levels of learning. In H. K. Smith (Eds.), Perception and reading, Proceedings of the International Reading Association, 1968, 12 (Part 4), 1-6.

Wepman, J. M. Modalities and learning. In H. M. Robinson (Ed.), Coordinating reading instruction. Glenview, Illinois: Scott Foresman, 1971.

Wittick, M. L. Innovations in reading instruction: For beginners (Chapter 3). In H. M. Robinson (Ed.), Innovation and change in reading (The sixty-seventh yearbook of the National Society for the Study of Education, Part II). Chicago: The University of Chicago Press, 1968.

Witty, P. A., & Sizemore, R. A. Studies in listening I: Relative values of oral and visual presentations. Elementary English, 1958, 35, 538-552.

Witty, P. A., & Sizemore, R. A. Studies in listening II: Relative values of oral and visual presentations. Elementary English, 1959, 36, 59-70. (a)

Witty, P. A., & Sizemore, R. A. Studies in listening III: The effectiveness of visual and auditory presentations with changes in ages and grade levels. Elementary English, 1959, 36, 130-40. (b)

Wolpert, E. M. Individual differences in sensory modality functioning in first grade children in learning to read common words of two imagery values (Doctoral dissertation, University of Kansas, 1970). Dissertation Abstracts International, 1970, 31:06, 2751A. (University Microfilms No. 70-25, 435)

Ysseldyke, J. E. Diagnostic-prescriptive teaching: The search for aptitude-treatment interactions. In L. Mann & D. A. Sabatino (Eds.), The first review of special education, 1973, 1, 5-32.

Bibliography

Bibliography

Budoff, M., & Quinlan, D. Reading progress as related to efficiency of visual and aural learning in the primary grades. Journal of Educational Psychology, 1964, 55, 247-252.

Castner, B. M. Prediction of reading disability prior to first grade entrance. The American Journal of Orthopsychiatry, 1935, 5, 375-387.

Coleman, J. C. Learning methods as a relevant subject variable in learning disorders. Perceptual and Motor Skills, 1962, 14, 263-269.

Cripe, A. E., & Wilson, B. A. Auditory and visual learning related to ITPA sensory channels. In Special education: Strategies for educational progress. Washington, D.C.: The Council for Exceptional Children, NEA, 1966, 153-156.

Cronbach, L. J., & Snow, R. E. Individual differences in learning ability as a function of instructional variables (final report). Stanford, California: University of California School of Education, 1969. (ERIC Document Reproduction Service No. ED 029 001)

Denison, J. W. Perceptual influences in the primary grades: An alternative consideration. Journal of School Psychology, 1968-69, 7, 38-46.

Fillmer, H. T., & Linder, R. Comparison of auditory and visual modalities. Education, 1970, 91, 110-113.

Gates, A. I. A study of the role of visual perception, intelligence, and certain associative processes in reading and spelling. The Journal of Educational Psychology, 1926, 17, 433-455.

Harris, A. J. Practical applications of reading research. The Reading Teacher, 1976, 29, 559-565.

Lilly, M. S., & Kelleher, J. Modality strength and aptitude-treatment interaction. The Journal of Special Education, 1973, 7, 5-12.

Monroe, M. Reading aptitude tests for the prediction of success and failure in beginning reading. Education, 1935, 56, 7-14.

Ringler, L. H., & Smith, I. L. Learning modality and word recognition of first-grade children. Journal of Learning Disabilities, 1973, 6, 307-312.

Robinson, H. M. Perceptual training--Does it help? In R. C. Aukerman (Ed.), Some Persistent Questions on Beginning Reading. Newark, Delaware: International Reading Association, 1972.

Smith, I. L., & Ringler, L. H. Preferred sensory modality, reading readiness, and reading achievement in first-grade children. Perceptual and Motor Skills, 1971, 32, 764-766.

Wepman, J. M. The perceptual basis for learning. In H. A. Robinson (Ed.), Meeting Individual Differences in Reading (Vol. 26), Proceedings of the Annual Conference on Reading. Chicago: The University of Chicago Press, 1964.

Wolpert, E. M. Modality and reading: A perspective. The Reading Teacher, 1971, 24, 640-643.

Appendix A

Summary of Scores

Summary of Scores for Auditory-Visual Pupils
Using the Open Court Correlated
Language Arts Program

Auditory-Visual Pupils (n=26)	Peabody Picture Vocabulary Test	Score on Auditory Portion of Informal Modality Test	Score on Visual Portion of Informal Modality Test	Total Score on Informal Modality Test	Metropolitan Readiness Tests (Pre-Reading Skills Composite)	Stanford Achievement Test (A + B)
01	121	80	82	162	68	2.3
02	113	86	80	166	66	2.0
03	97	89	84	173	59	2.6
04	95	80	76	156	32	1.6
05	117	83	90	173	69	3.8
06	115	66	62	128	47	2.4
07	119	71	71	142	61	2.2
08	111	71	69	140	61	1.7
09	121	77	85	162	63	1.5
10	111	73	82	155	64	3.0
11	127	78	86	164	66	2.5
12	115	66	69	135	68	2.1
13	117	74	66	140	63	2.1
14	113	68	60	128	63	4.6
15	105	76	75	151	63	3.5
16	101	68	59	127	51	2.0
17	103	68	66	134	57	2.0
18	118	93	100	193	65	3.8
19	123	86	80	166	70	2.4
20	123	73	77	150	65	1.6
21	121	84	88	172	65	1.8
22	109	75	75	150	40	1.5
23	109	88	91	179	65	3.8
24	111	83	84	167	69	4.6
25	103	57	65	122	40	1.5
26	113	57	49	106	49	1.9

Summary of Scores for Auditory-Visual Pupils
Using the Harper and Row Basic
Reading Program

Auditory-Visual Pupils (n=8)	Peabody Picture Vocabulary Test	Score on Auditory Portion of Informal Modality Test	Score on Visual Portion of Informal Modality Test	Total Score on Informal Modality Test	Metropolitan Readiness Tests (Pre-Reading Skills Composite)	Stanford Achievement Test (A + B)
*27	108	44	47	91	36	1.2
28	103	60	69	129	42	1.6
*29	111	53	52	105	34	1.2
30	113	67	73	140	54	2.1
*31	97	62	60	122	52	1.3
32	99	68	72	140	53	2.2
33	117	87	90	177	67	2.4
34	103	47	54	101	30	2.3

*not reading at a minimum 1.5 grade level

Summary of Scores for Visual Pupils

Visual Pupils (n=17)	Peabody Picture Vocabulary Test	Score on Auditory Portion of Informal Modality Test	Score on Visual Portion of Informal Modality Test	Total Score on Informal Modality Test	Metropolitan Readiness Tests (Pre-Reading Skills Composite)	Stanford Achievement Test (A + B)
44	125	46	64	110	39	2.2
*45	99	39	68	107	54	.6
46	121	49	65	114	57	2.2
47	99	65	86	151	60	2.2
*48	115	41	58	99	39	1.2
49	116	76	95	171	70	3.5
50	111	72	93	165	67	2.5
51	121	53	77	130	55	1.8
52	111	79	92	171	72	4.6
53	101	57	81	138	51	2.1
*54	125	61	86	147	53	1.4
55	111	87	100	187	64	4.6
*56	105	49	66	115	39	1.4
57	107	42	75	117	51	2.1
58	115	69	97	166	68	2.1
59	109	61	86	147	70	1.5
*60	105	67	83	150	62	.1

*not reading at a mininum 1.5 grade level

Summary of Scores for Auditory Pupils

Auditory Pupils (n=9)	Peabody Picture Vocabulary Test	Score on Auditory Portion of Informal Modality Test	Score on Visual Portion of Informal Modality Test	Total Score on Informal Modality Test	Metropolitan Readiness Tests (Pre-Reading Skills Composite)	Stanford Achievement Test (A + B)
*35	145	69	55	124	60	1.4
36	97	83	36	119	47	1.7
37	95	84	70	154	54	1.8
*38	107	86	61	147	61	1.3
*39	111	69	41	110	44	1.2
40	117	89	79	168	62	6.0
41	117	63	52	115	64	2.1
42	93	70	51	121	54	1.5
43	125	83	53	136	56	3.3

*not reading at a minimum 1.5 grade level

Appendix B

Informal Modality Subtest Scores

Informal Modality Subtest Scores of the Auditory-Visual Pupils
Using the Open Court Correlated Language Arts Program

Auditory-Visual Pupils (n=26)	A-1	A-2	A-3	A-4	A-5	A-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13
01	9	16	25	12	12	6	8	20	10	19	10	6	9
02	10	23	27	8	12	6	8	20	10	21	3	8	10
03	9	23	26	11	9	11	6	16	9	18	21	5	9
04	9	22	24	12	11	2	7	18	10	21	4	7	9
05	10	17	24	11	10	11	8	14	10	18	22	8	10
06	10	18	22	0	10	6	5	14	2	11	14	7	9
07	10	16	20	12	9	4	7	16	5	16	10	7	10
08	5	19	26	11	4	6	5	16	6	16	11	7	8
09	10	19	17	11	10	10	8	12	9	17	22	7	10
10	8	19	18	11	11	6	8	18	8	19	15	5	9
11	9	21	20	11	10	7	6	18	10	16	20	8	8
12	8	14	19	12	7	6	8	20	3	15	6	8	9
13	10	19	21	12	10	2	8	16	7	11	12	3	9
14	10	22	21	12	1	2	5	16	1	12	10	7	9
15	9	21	21	12	9	4	7	12	9	22	12	4	9
16	7	17	21	11	10	2	2	12	8	18	5	6	8
17	10	16	18	12	8	4	7	12	7	17	8	6	9
18	10	21	27	12	12	11	8	20	9	21	24	8	10
19	10	24	28	12	6	6	8	20	9	21	7	6	9
20	10	15	21	12	11	4	6	16	2	20	19	7	7
21	8	25	25	12	8	6	7	18	10	19	19	7	8
22	10	18	24	12	7	4	7	18	7	10	17	6	10
23	9	23	27	11	10	8	7	20	10	22	17	8	7
24	10	20	23	12	12	6	8	16	10	19	14	7	10
25	10	8	16	12	9	2	6	12	6	17	9	7	8
26	9	9	18	12	9	0	7	16	1	16	2	4	3

Informal Modality Subtest Scores of the Auditory-Visual Pupils
Using the Harper and Row Basic Reading Program

Auditory-Visual Pupils (n=8)	A-1	A-2	A-3	A-4	A-5	A-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13
27	0	16	24	0	0	4	7	16	1	13	0	3	7
28	10	12	19	11	4	4	6	14	7	17	8	8	9
29	4	19	15	11	0	4	3	14	5	16	2	4	8
30	9	13	21	11	11	2	6	20	8	19	6	6	8
31	4	17	25	10	0	6	6	20	4	14	0	7	9
32	5	20	23	11	9	0	5	12	3	21	21	4	6
33	9	27	23	11	12	5	8	20	10	22	14	7	9
34	7	19	19	2	0	0	6	10	5	19	0	6	8

Informal Modality Subtest Scores of the Auditory Pupils

Auditory Pupils (n=9)	A-1	A-2	A-3	A-4	A-5	A-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13
35	9	22	24	7	7	0	7	10	4	12	14	7	1
36	10	27	26	8	6	6	6	4	3	11	0	6	6
37	9	21	28	12	10	4	5	10	6	17	20	7	5
38	10	21	24	11	9	11	4	12	8	17	7	5	8
39	8	16	20	12	7	6	4	14	5	6	6	2	4
40	10	20	27	11	12	11	8	18	9	20	8	7	9
41	0	18	18	12	11	4	6	16	5	14	4	5	2
42	9	16	25	11	9	0	8	8	5	16	0	7	7
43	10	19	20	12	11	11	5	14	6	19	2	5	2

Informal Modality Subtest Scores of the Visual Pupils

Visual Pupils (n=17)	A-1	A-2	A-3	A-4	A-5	A-6	V-7	V-8	V-9	V-10	V-11	V-12	V-13
44	9	19	18	3	0	8	4	20	9	14	5	4	8
45	4	17	17	1	0	0	7	16	0	18	12	7	8
46	8	11	15	10	5	0	7	16	9	17	4	7	5
47	0	25	16	10	12	2	20	7	10	18	16	6	9
48	8	6	13	8	2	4	4	16	2	15	11	5	5
49	10	20	15	12	10	9	7	18	10	19	24	7	10
50	10	20	19	12	5	6	8	20	10	17	21	7	10
51	0	17	15	12	1	8	6	16	2	19	24	7	3
52	10	19	22	12	12	4	8	20	10	22	15	7	10
53	9	15	13	12	6	2	8	18	9	19	11	7	9
54	0	15	24	12	3	7	6	20	8	16	20	7	9
55	9	22	28	12	12	4	8	18	10	22	24	8	10
56	5	9	16	11	8	0	4	18	1	16	17	7	3
57	0	9	22	8	3	0	8	18	8	17	10	5	9
58	10	19	13	12	9	6	8	20	10	19	24	7	9
59	10	16	19	8	0	8	4	14	9	20	24	6	9
60	10	17	18	12	3	7	6	16	10	17	17	7	10

Appendix C

Tests Used or Adapted for Use On the Informal Modality Test

Clymer-Barrett Prereading Battery, Form A. Clymer, T., & Barrett, T. C. Lexington, Massachusetts: Personnel Press, 1967.

Detroit Tests of Learning Aptitude. Baker, H. J., & Leland, B. Indianapolis: Bobbs-Merrill, 1967.

Developmental Test of Visual-Motor Integration. Beery, K. E. Chicago: Follett, 1967.

Gates Reading Readiness Tests. Gates, A. I. Columbia University, New York: Bureau of Publications, Teachers College, 1939.

Metropolitan Readiness Tests, Level II, Form P. Nurss, J. R., & McGauvran, M. E. New York: Harcourt Brace Jovanovich, 1974.

Peabody Picture Vocabulary Test. Dunn, L. M. Minneapolis: American Guidance Service, 1965.

Pre-Reading Screening Procedures: to Identify first Grade Academic Needs. Slingerland, B. H. Cambridge, Massachusetts: Educators Publishing Service, 1969.

Stanford Achievement Test, Primary Level I, Form A. Madden, R., Gardner, E. F., Rudman, H. C., Karlsen, B., & Merwin, J. C. New York: Harcourt Brace Jovanovich, 1973.

Wepman Auditory Discrimination Test. Wepman, J. M. Chicago, Illinois: Language Research Associates, 1958.

Appendix D

Informal Modality Test

Kindergarten to First Grade Screening Test

Name _____ Date _____

Teacher _____ A.M. _____ P.M. _____

(Kindergarten)

AUDITORY

Test		Score
A - 1	Auditory Discrimination	
A - 2	Auditory Memory for * Sentences	
A - 3	Auditory Memory for Unrelated Words	
A - 4	Rhyming	
A - 5	Blending	
A - 6	Oral Directions	

Total _____ (104)

VISUAL

Test		Score
V - 7	Visual Discrimination	
V - 8	Visual Memory for Letters & Numbers	
V - 9	Word Matching *	
V - 10	Copy Forms *	
V - 11	Disarranged Pictures	
V - 12	Copy a Sentence	
V - 13	Horst Reversal	

Total _____ (104)

Test Total _____ (208)

Letter Naming _____ (52)

Picture Naming _____ (22)

Test	Date	Number Score	Rating	I. Q.	M. A.
Metropolitan					
P P V T					
Brenner					

*Reading Success Prediction H A L Recommendation: _____

Kindergarten to First Grade
Screening Test

ditory Discrimination Test

Name _____

Date _____

rections: Have child sit with his back to you. Say, "Tell me if the words I say are the same or different words." Mark only the correct responses by putting a check mark in the box.

coring: Subtract 5 from the total number of correct "D" responses.

	D	S
. fear - gear		
. led - bed		
. stake - shake		
. fall - fall		
. bead - seed		
. sing - sing		
7. pit - pat		
8. bag - bad		
9. cope - rope		
10. tone - tone		

	D	S
11. tar - tar		
12. show - shoe		
13. ledge - ledge		
14. vie - tie		
15. pit - mitt		
16. thumb - thump		
17. bag - sag		
18. sill - till		
19. mop - pop		
20. heart - chart		

Total _____

(20)

Kindergarten to First Grade
Screening Test

mory for Sentences

Name _____

Date _____

rections: "Say these sentences after me. I can say them only once so listen carefully."

oring: Each correct sentence is scored 3 points.
One mistake is scored 2 points.
Two mistakes is scored 1 point.
Three or more mistakes are scored 0 points.

My doll has pretty hair. _____

Our new car has four red wheels. _____

The bell on the engine rings loudly. _____

. In the summer we go north where it is cool. _____

. We saw a little fire on the way to school. _____

. The men painted our new house white with dark green blinds. _____

. The art teacher comes to our school three days a week. _____

. Ten persons went to a party where there was lots to eat. _____

. Three boys spent a happy day last week on a fishing trip. _____

Total _____

(27)

Kindergarten to First Grade
Screening Test

Memory for Unrelated Words

Name _____

Date _____

Directions: "Say these words after me. I can say them only one time, so listen carefully."

Scoring: Each correct word counts as one point, no matter what order the child repeats them in. Number the order of the words as the child repeats them.

1. cat....ice _____
2. dog....ship _____
3. man....horse....song _____
4. pen....girl....cow _____
5. cart....bird....desk....road _____
6. head....Milk....dress....cats....night _____
7. fish....clock....heart....sun....box.... _____
8. mud....vase....north....ten....rain....cross _____

Total _____

(30)

Kindergarten to First Grade
Screening Test

Rhyming Words

Name _____

Date _____

Directions: "I know some words that rhyme. House and mouse rhyme....lice and nice rhyme. Now you give a word that rhymes with these words: cat.... see....sit...." Continue in same manner as sample, noting on paper the word the child gives you.

Scoring: Each word that rhymes counts as one point.

1. Red _____
2. we _____
3. pan _____
4. bun _____
5. rim _____
6. bord _____
7. vad _____
8. tie _____
9. pez _____
10. gas _____
11. fin _____
12. nose _____

Total_____

(12)

Kindergarten to First Grade Screening Test

Blending Test

Name _____

Date _____

Directions: "I will rhyme with fan: c.c.c...can. These words sound the same because they have the same ending.

Here is another word - hail. Let's rhyme with it. Listen for the sound: p.p.p... (pail = student response).

Here is another word - house. Let's rhyme with it. Listen for the sound: l.l.l... (louse = student response).

Give me the word that rhymes with each word I say. I will give you a sound and you will blend it to make a new rhyming word."

1. cat (r...r...r)
2. fish (w...w...w)
3. bee (l...l...l)
4. set (h...h...h)
5. Jill (f...f...f)
6. lip (t...t...t)
7. hand (b...b...b)
8. pail (m...m...m)
9. bent (k...k...k)
10. rank (s...s..s)
11. fell (z...z...z)
12. hot (g...g...g)

Total _____ (12)

Scoring: One point for each correct response.

Kindergarten to First Grade
Screening Test

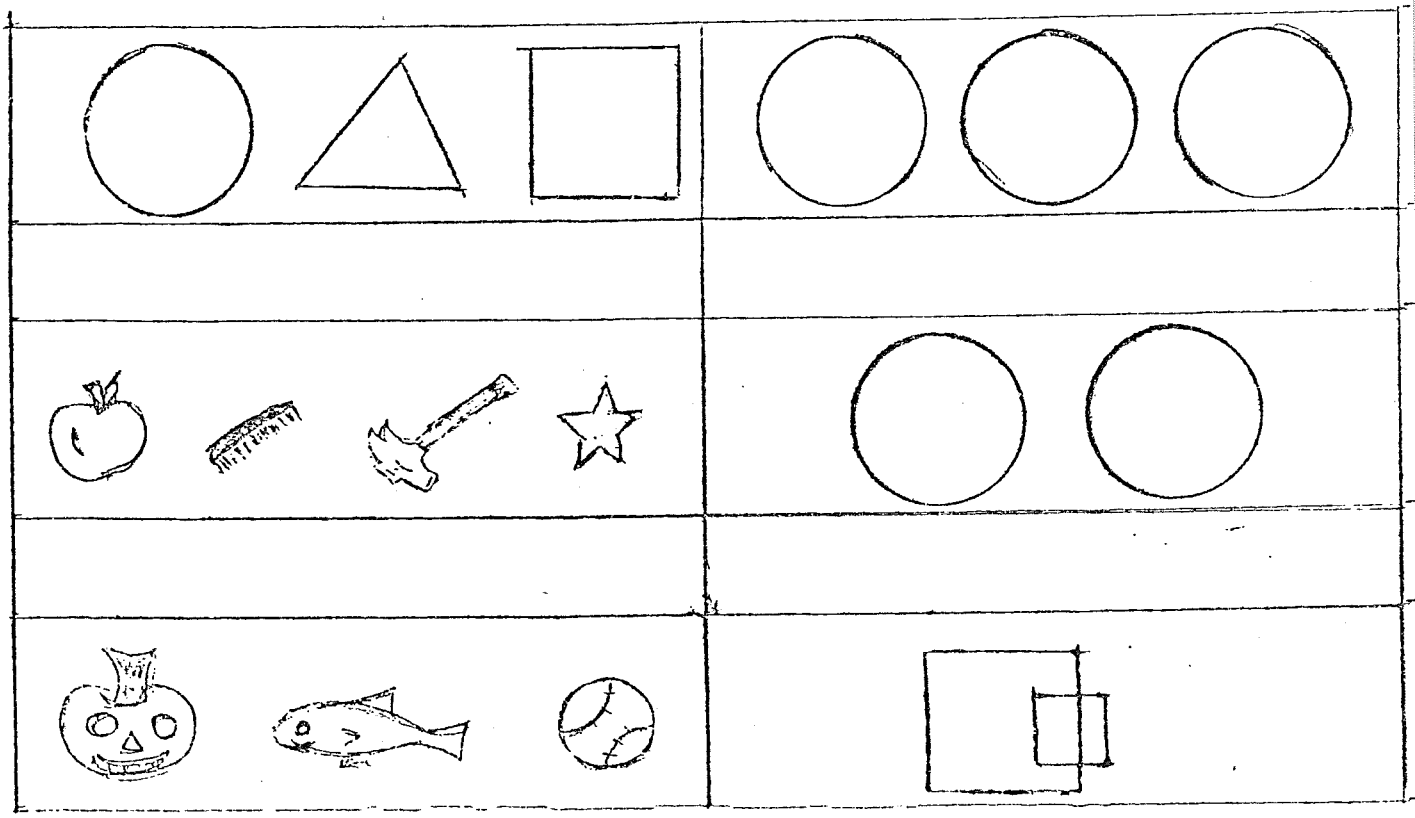
Oral Directions

Name _____

Date _____

Directions: See attached sheet

Scoring: Correct response on square 1 = 2 points, on square 2 = 2 points, on square 3 = 2 points, on square 4 = 3 points, on square 5 = 2 points, on square 6 = 2 points.



Total _____
(13)

Place the sheet before the subject. Give the directions for each set slowly and very clearly without special emphasis on any word or phrase. Be sure that the subject waits until the directions for a given set are completed before he is permitted to start. Say, "You see this page. I am going to tell you some things to do with what you see on this page. Now listen carefully, and each time after I get all through, you do just exactly what I have said to do. Be sure to wait each time until I finish and say, 'Do it now.' Look at No. 1. It has three drawings." (Point to all three in the pupil's booklet. Pause.)

Give directions for each set as indicated below. Say, "Stop" at the end of each time allowance. Any set must be entirely correct for credit.

It is best to call attention to the next set by saying, "Look at No. 2," "Look at No. 3," etc., throughout the test.

1. Put a one in the circle and a cross in the square box. Do it now!

2. Draw a line from the thimble to the star that will go down under the comb and up over the hammer. Do it now!

3. Be sure to wait until I get all through. Draw a line from the rabbit to the ball that will go up over the fish, and put a cross on the fish. Do it now!

4. See the three circles. Put a number two in the first circle, a cross in the second circle, and draw a line under the third circle. Do it now!

5. Draw a line from the bottom of the first circle to the top of the second, and put a cross in the second circle. Do it now!

6. Put a three in the part that is the large box only and a cross in the part that is in both boxes. Do it now!

Kindergarten to First Grade
Screening Test

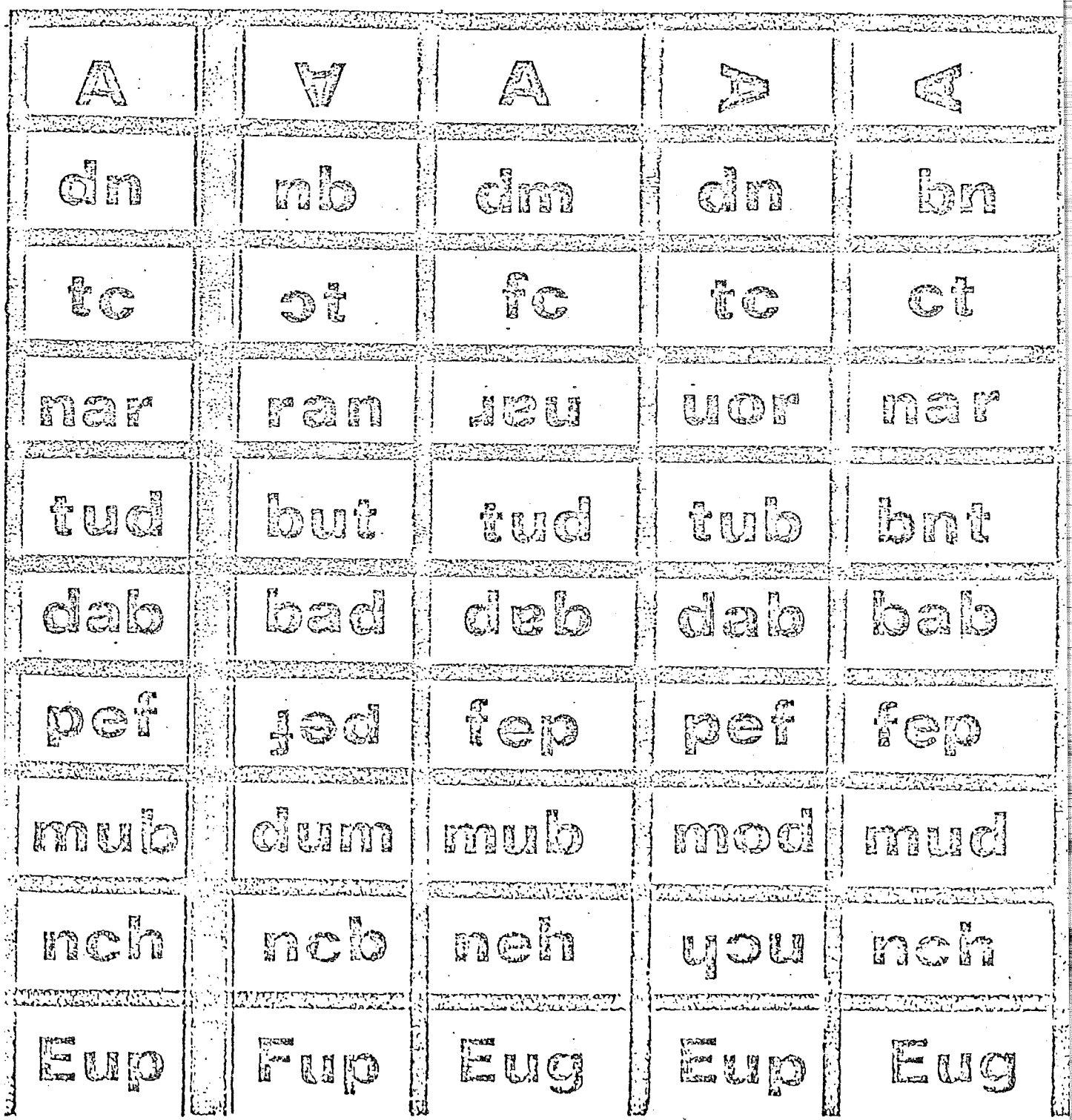
Discrimination Test

Name _____

Date _____

ons: First 2 rows are examples. Say, "Find another group of letters just like this one. Put a cross on it." Point to first symbol.

1 point for each correct response.



Kindergarten to First Grade
Screening Test

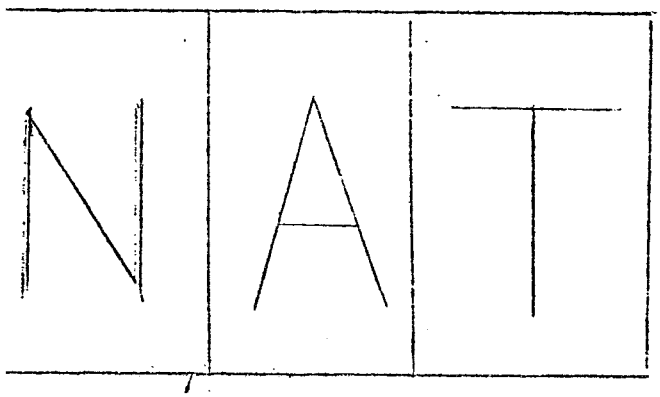
isual Memory for Letters and Numbers

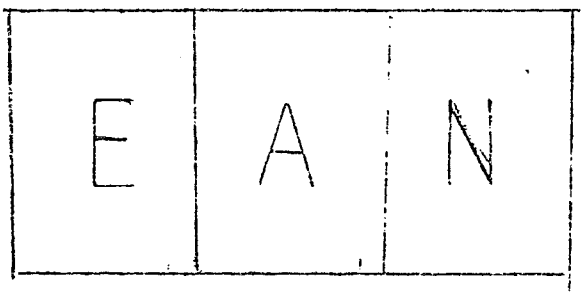
Name _____

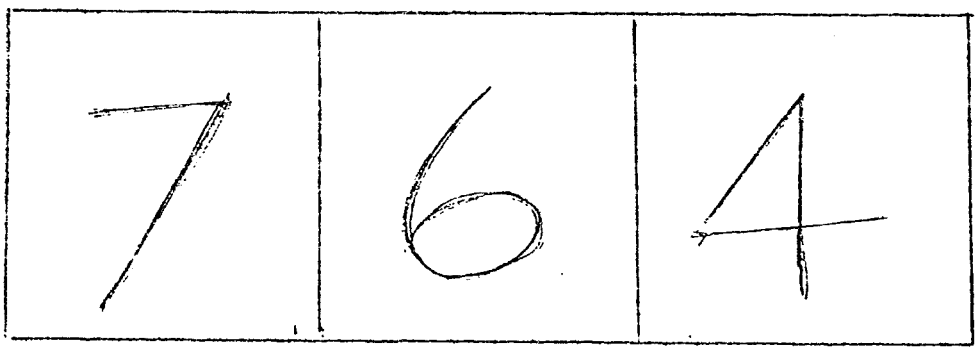
Date _____

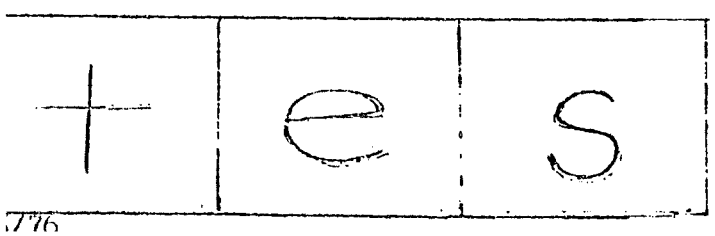
irections: Arrange squares in order. Exhibit for 10 seconds then cover while child arranges his in same way. Child has two chances to make a correct response.

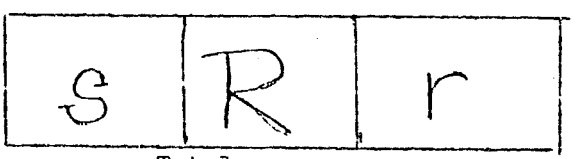
coring: 4 points for correct response on first try. 2 points for correct response on second try. 0 points for no correct response.











Total _____
(20)

776

Kindergarten to First Grade Screening Test

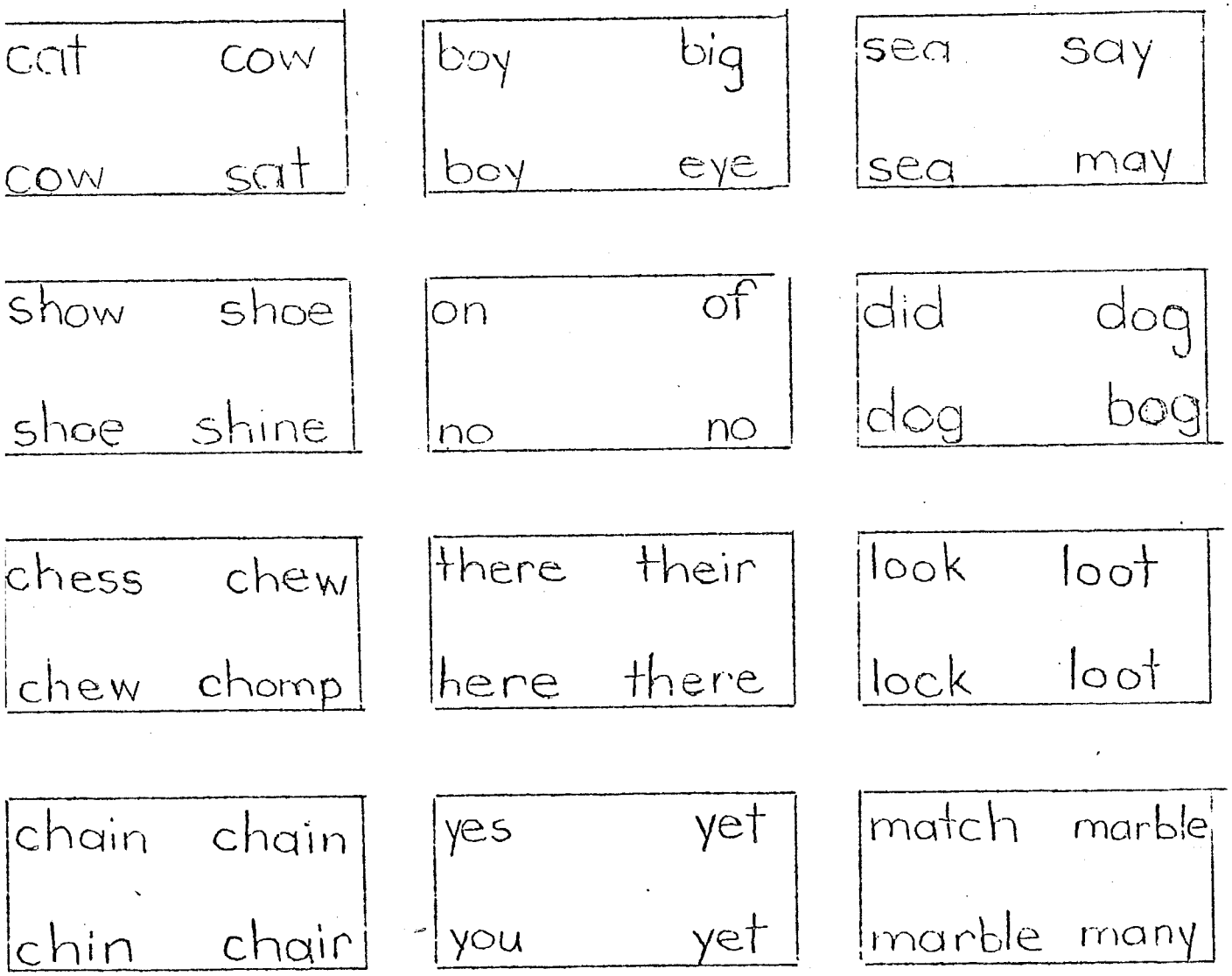
Word Matching Test

Name_____

Date_____

Directions: "Draw a line between the words that look just alike."

Scoring: One point for every correct block.



Total_____
(10)

Kindergarten to First Grade
Screening Test

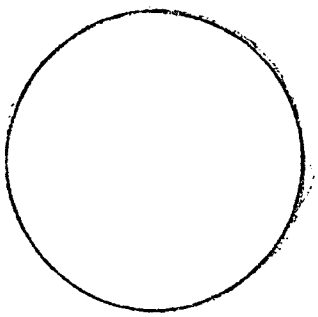
Copy Forms

Name _____

Date _____

Directions: "Make one of these over here." Point to shape and then to blank space

Scoring: Rate response at 0, 1 or 2 points - maximum of 6 points.



Total

Kindergarten to First Grade
Screening Test

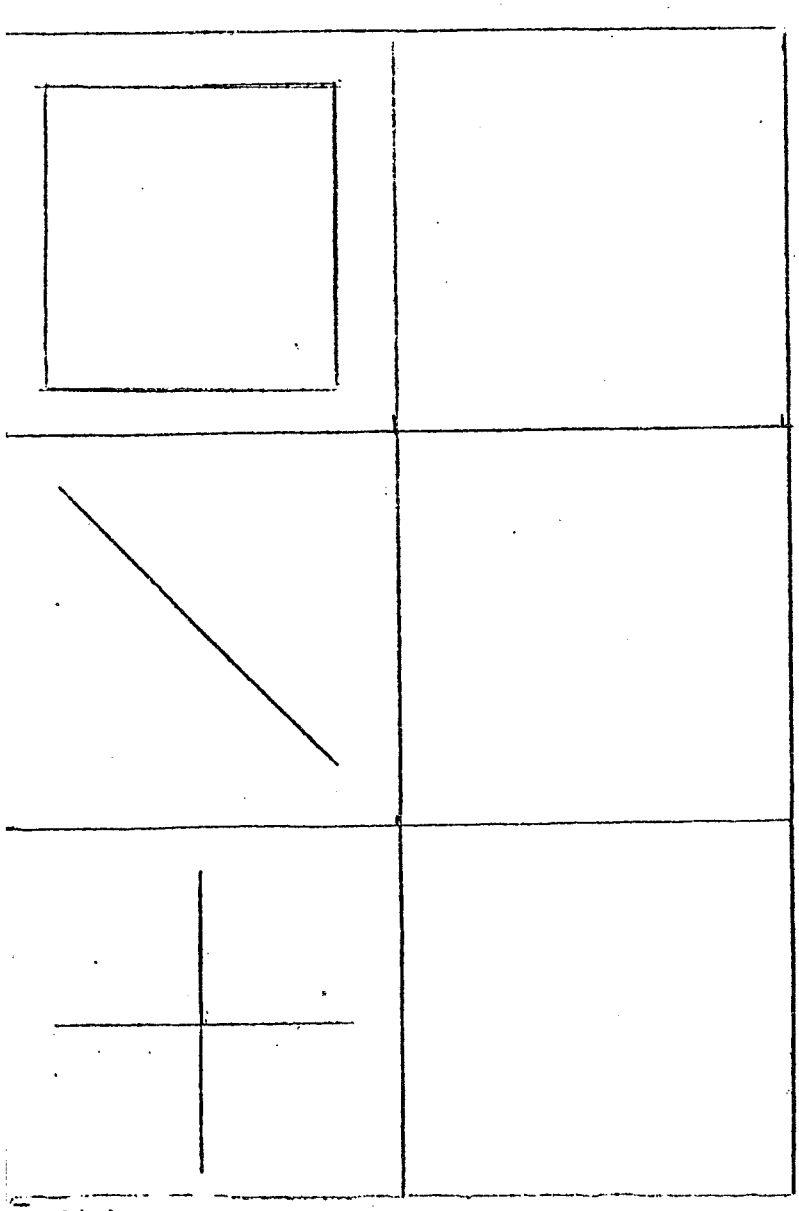
Copy Forms

Name _____

Date _____

Directions: "Make one of these over here." Point to shape and then to blank space

Scoring: Rate response at 0, 1 or 2 points - maximum of 6 points.



Total _____
(6)

5/76

Kindergarten to First Grade
Screening Test

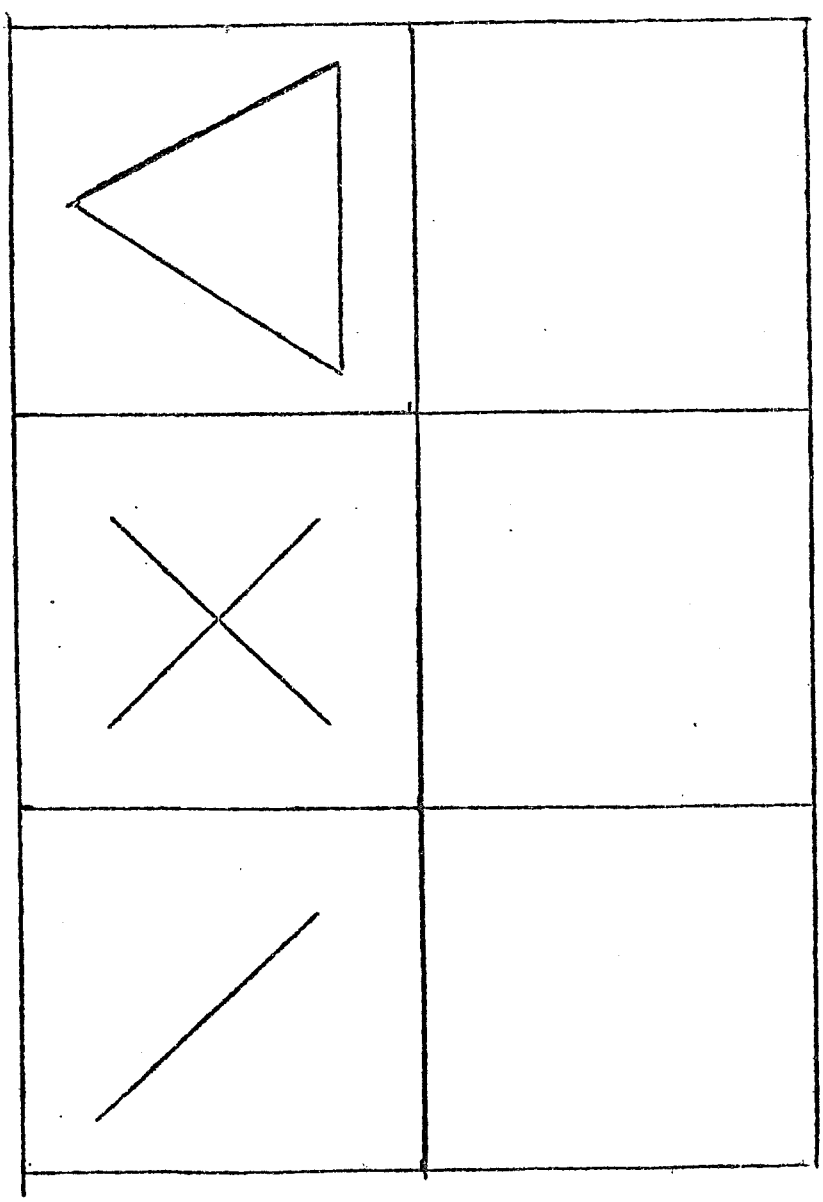
Copy Forms

Name _____

Date _____

Directions: "Make one of these over here." Point to shape and then to blank space

Scoring: Rate response at 0, 1 or 2 points - maximum of 6 points.



Total _____
(6)

5/76

Kindergarten to First Grade
Screening Test

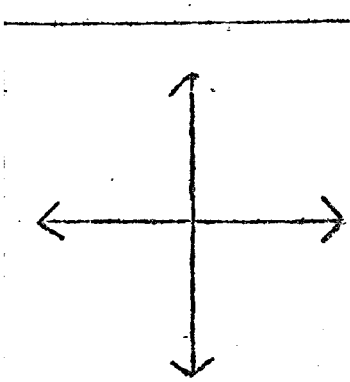
Copy Forms

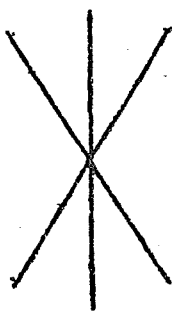
Name_____

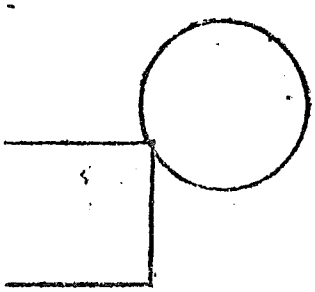
Date_____

Directions: "Make one of these over here." Point to shape and then to blank space

Scoring: Rate response at 0, 1 or 2 points - maximum of 6 points.







Total

(6)

E/76

Kindergarten to First Grade
Screening Test

Disarranged Pictures

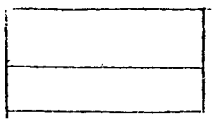
Name _____

Date _____

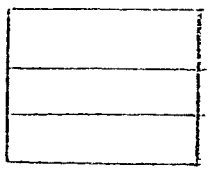
Directions: Use Detroit Tests of Learning Aptitude

Scoring: One point for each piece correctly placed regardless of whether the entire picture is correct or not.

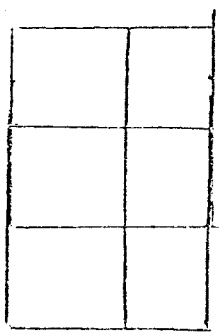
A



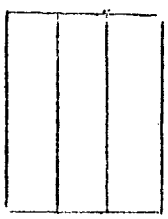
1.



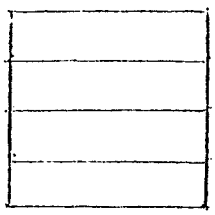
2.



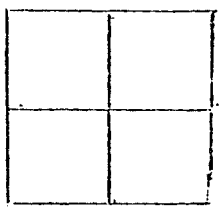
3.



4.



5.



6.

Total _____
(24)

bottom lines of the sheet just like it is written on the top two lines."

Screening Test

Date _____

the black dog

jumped over the box

95

Scoring: Rate using these guide lines: 2 points - staying on line, 2 points - correct proportions, 2 points - compl
2 points - letter formation. Maximum points - 8 ; Total _____

5/76

V-

Kindergarten t First Grade
Screening Test

Horst Reversal Test

Name _____

Date _____

Directions: "Draw a circle around the groups of letters that are just like the first one."

Score: 1 point for each correctly marked row.

ot	to	ot	to	ot	ot	to
de	ed	de	de	ed	ed	de
ra	ar	ar	ra	ra	ar	ar
nu	nu	un	un	nu	un	
pot	top	pot	pot	top		
bcd	bad	dab	dab	bad		
les	sel	les	les	sel		
pjk	pjk	kjp	kjp	pjk		
sof	fos	sof	sof	fos		
man	nam	nam	man	man		

Total _____
(10)